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Pacific Seabird Group

BULLETIN

Volume 8 Number 2 Winter 1981

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PACIFIC SEABIRD GROUP

The Pacific Seabird Group (PSG) was formed in 1972 out of a need for better communication among Pacific seabird researchers. The Group acts to coordinate and stimulate the field activities of its members and to inform its membership and the general public of conservation issues relating to Pacific seabirds and the marine environment. Current activities include involvement in seabird sanctuaries, human disturbances, coastal surveys, seabird/fisheries interactions, and legislation. Policy statements are issued on conservation issues of critical importance. While the PSG's primary area of interest is the west coast of North America and adjacent areas of the Pacific, it is hoped that seabird enthusiasts in other parts of the world will join and participate in the PSG. Annual dues for membership in the PSG are $10.00 and are payable to the Treasurer (address on back cover). Members receive the PSG Bulletin.

PACIFIC SEABIRD GROUP BULLETIN

The Pacific Seabird Group Bulletin is issued in the spring or summer and fall or winter of each year. It contains news of interest to PSG members. Regional reports include a listing of current research and information on seabird conservation. The PSG Bulletin does not act as an outlet for the results of scientific research, but welcomes articles on seabird conservation, seabird research activities or other topics that relate to the objectives of the PSG. Articles and all other materials should be submitted to the Editor. Back issues of the PSG Bulletin (starting with Spring 1974) are available from the Treasurer for $2.50 each.

PERMANENT ADDRESS

Pacific Seabird Group, c/o Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, CA 94970.

Note: This address is only for use of people who lose track of the current officers. Routine correspondence should be sent to the appropriate council member as listed on the back cover.

Informal poll on David Nettleship's Proposal

_____ I support the proposal to expand the geographic area of interest of the PSG and to change the name of the group to reflect this.

_____ No, I do not support this proposal.

_____ I have no opinion on this proposal.

If PSG changes its name, I suggest _____

_____

Comments on PSG's geographical focus _____

_____

_____

Suggestions on possible changes in system of Regional Representatives _____

_____

_____

_____

My ideas on the role of conservation in PSG _____

_____

_____

_____

_____

My other concerns _____

_____

_____

_____

Please sign if you would like to be contacted for further recommendations.

Signed _____

This form is to inform the Executive Council of the membership's opinion on these issues and to help it develop formal proposals.

(Please fold, stamp, and mail to the Chairman of the Pacific Seabird Group as addressed on the back)

1st Class
Stamp

Dr. Harry M. Ohlendorf, Chairman
Pacific Seabird Group
c/o Division of Wildlife and Fisheries Biology
University of California
Davis, CA 95616
U.S.A.

As a member in good standing, I wish to nominate representatives:

Regional Representative (one each from)

Alaska _____

Washington _____

Northern California _____

Hawaii _____

Mexico _____

I also suggest the following nominations for officers:

Chairman-Elect _____

Secretary _____

Treasurer _____

Signed _____

(Please fold, stamp, and mail to the Coordinator of the Election Committee as addressed on the back)

1st Class
Stamp

Dr. P. Dee Boersma
Coordinator, PSG Election Committee
Institute of Environmental Studies
217 Engineering Annex FM-12
University of Washington
Seattle, WA 98195
U.S.A.

PACIFIC SEABIRD GROUP
BULLETIN

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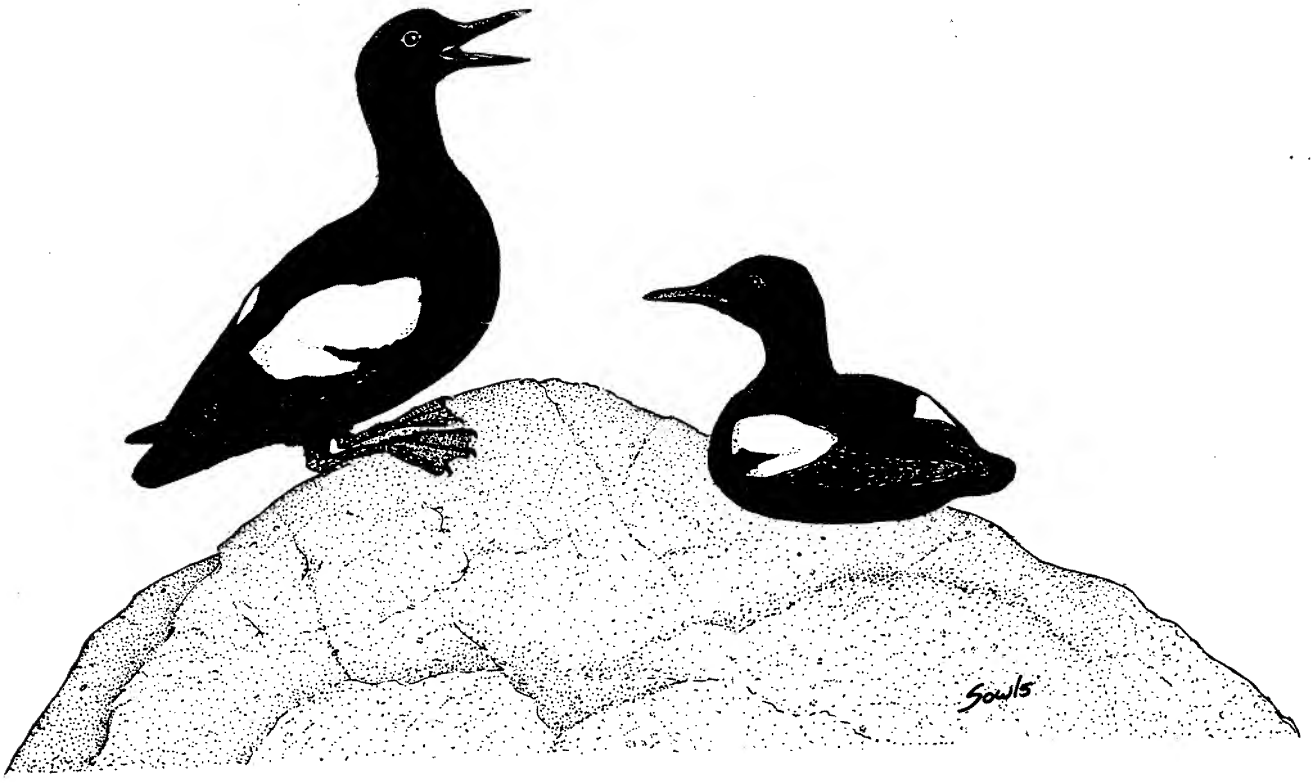

Sowls

THE EDITOR'S PAGE

David Nettleship's modest proposal (in this issue) from seabird biologists in northeastern North America has raised broad questions on the nature of the Pacific Seabird Group. These center on whether PSG is or should remain focused on the Pacific and whether PSG is primarily a scientific society or a conservation group.

The studies and interests of our members extend to all marine areas. David points out the high percentage of papers given at our annual meetings on work done outside the Pacific. The results of work done throughout the world are relevant to understanding Pacific seabird biology.

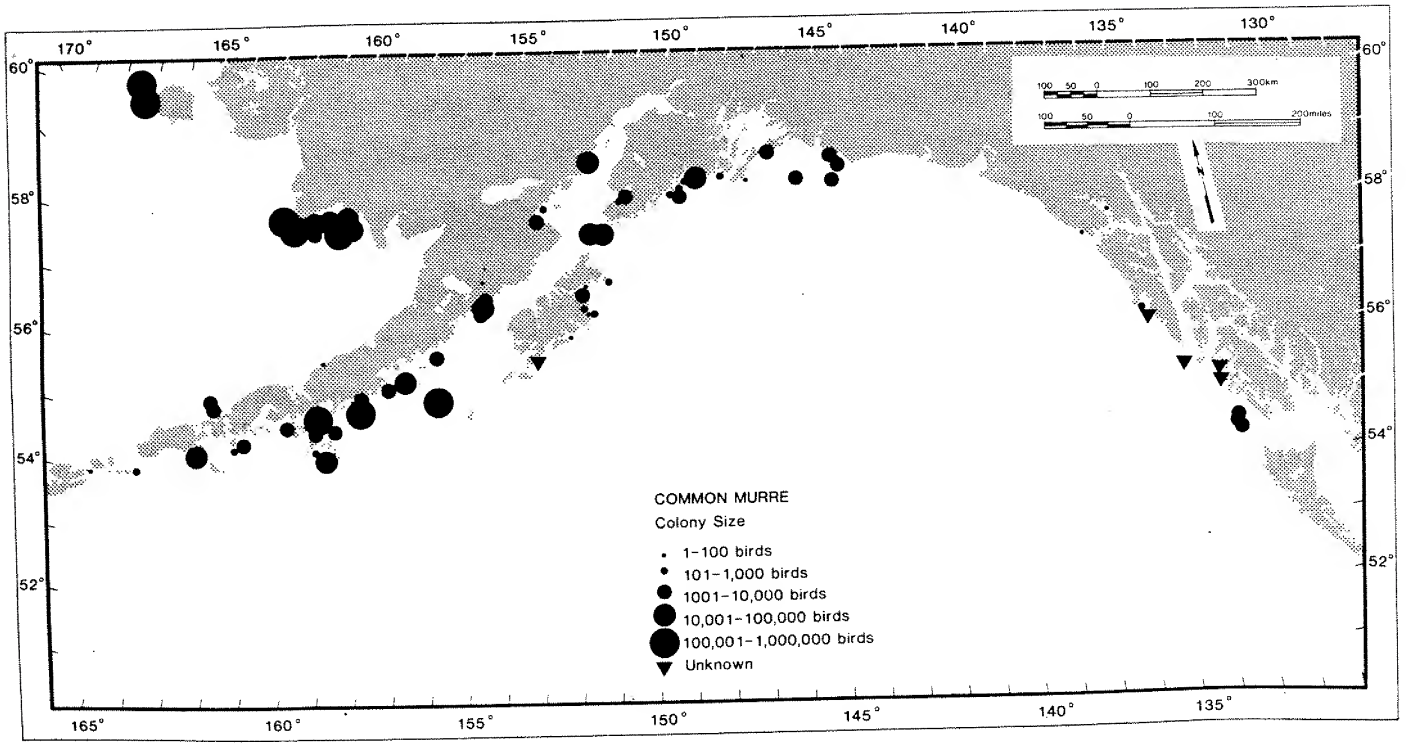
Some fear that a name change will indicate that the concerns and interests of the group have somehow become restricted. On the contrary, this is an opportunity to announce that our outlook has already widened and we are interested in expanding it. If we are interested in the world's seabirds, why not say so? The suggestion that we call ourselves the Marine Bird Society is in this spirit. Such a move will better reflect the interests of the membership and stimulate growth of the organization. If we hope ever to publish a journal, we will need about 10 times the current membership.

If PSG goes international, changes in the bylaws will be necessary. One issue which needs careful consideration is the regional representative system. How can it be changed best to reflect a broader regional outlook? Enlarging the Council is one possibility, but carrying out business might then be more difficult.

The relative importance of science and conservation in the group needs to be explored. When the group was formed, most hoped it would be active in conservation; many still feel this way. Recently the group has functioned almost exclusively as a scientific society. If we expand our geographic focus, it will be even easier to be less involved with conservation. This is a good time to reevaluate the philosophy and goals of PSG. We must decide if we are a scientific organization, a conservation organization, or some blend of the two. If conservation is to be an important activity of the group, we need to revitalize our commitment.

These issues will be addressed and important decisions made at the next annual meeting. It is important that all members present their views and help the Council define alternative solutions. Please send your ideas on a

new name, an expanded geographical focus, a new system of regional representatives, what we should do about conservation, and any other concern to any member of the Council soon. A form for gathering an informal consensus is enclosed. Letters for the next Bulletin are encouraged. Harry Ohlendorf will summarize the response received in the next Bulletin and will indicate what issues the Council will resolve and mechanisms for member participation. Members will probably be asked to vote on several of them.



THE CHAIRMAN'S PAGE

As outgoing chairman of PSG, I would like to thank members for their support and interest in PSG affairs during my year in office. Our editor expressed concern that PSG may pave its road to hell, and one past chairman (1976) worried about the effects of a decline of financial funding for seabird programs on the membership. I have attended each PSG meeting since 1975 and have observed our organization grow strong during that period even though U.S. funding for seabird programs is at an all-time low. Our last annual meeting in Seattle was a success and indicated that PSG is stronger than ever.

We are now at a crossroads in planning for PSG's future. This Bulletin contains a proposal to have PSG drastically change its course from a Pacific to a primarily North American organization. Even its familiar name, which has become dear to me and perhaps to other members over the years, will be dropped if members accept the changeover. Will the cost be worth it? Some of our Hawaiian members already have expressed concern on how the proposed change will affect them. As all the advantages of the changeover will be undoubtedly emphasized in the proposal, it is only fair that some of the inherent disadvantages are expressed in order to maintain a balanced view. My personal concern is the eventual dilution of Pacific seabird matters both in scope and in depth if we change from one to two ecosystems. Future planned closer contacts with seabird biologists in countries on the Pacific rim may also suffer if we shift emphasis from Pacific to North American issues.

It was hinted at the PSG Council meeting that if the suggested change is not accepted, 50 PSG members in the Atlantic region might leave our organization. If Atlantic members feel that strongly, would it not be better for them to establish an Atlantic Seabird Group with which PSG could maintain close ties and have joint meetings as deemed necessary by both organizations?

Before PSG members rush into a new organization with serious consequences, I would like to remind them of some relevant advice offered with considerable foresight by one of our past chairmen (Anderson, 1978):

> The PSG meetings are still the best, in my opinion, that I attend each year. The PSG is still a close-knit group of friends and colleagues; and information exchanges freely at these meetings. That too might be challenged by extensive and rigid consolidations with other seabird or ornithological groups. Thus, it seems important that PSG expand its contacts and activities in working with

other such groups, but not at the expense of PSG's localized identity. Consolidation through a unified publication, but not consolidation of such organizations themselves seems to be one way of accomplishing this.

When you read this page, this conservative and sentimental fool will probably be in Chile. When I meet some interested Chilean marine biologists, I plan to ask them to join PSG, as we have Pacific issues in common. Would they still be interested in joining us if I further inform them that in the near future we may dwell principally on North American issues?

I would like to bring up one other important issue. The term of PSG Chairman allows for optimal innovation and flexibility of PSG management. Continuity, however, is maintained with the appointment of a Chairman-Elect and the longer terms for Secretary, Treasurer, and Editor. I hope that PSG bylaws will never be changed to extend the one-year term for PSG Chairman. Many organizations have the same chairman or editor for five years or more which limits maximal managerial participation by members. Such chairmen or editors are difficult to replace when they have gained much expertise; or when they are incompetent, they are not easy to dislodge before their term expires. PSG's present structure allows for participatory democracy at its best as evidenced by members selecting such an odd fellow as the undersigned to represent them in 1981.

Some further improvements can be made to maintain fair representation. About one-third of our members are women. In the eight years of PSG's existence, no woman served as Vice-chairman (now Chairman-Elect) or Chairman. As we have many capable women in PSG, I strongly urge members to consider nominating women for the position of Chairman-Elect in the next election.

See you in Honolulu. Aloha.

Kees Vermeer
9 January, 1982
Sidney, British Columbia

A Proposal

For a considerable period now (1-2 years), there has been much discussion by seabird workers/enthusiasts on the Atlantic seaboard of NE United States and Eastern Canada concerning the need for a mechanism to better exchange information and deal with conservation issues related to seabirds. This discussion reached a peak in October 1981 which resulted in the decision to hold a meeting on 8 December 1981 at the Bedford Institute of Oceanography (Dartmouth, Nova Scotia) comprising seabird biologists from the New England States, Quebec, New Brunswick, Newfoundland, and Labrador to address two key questions:

(1) Is there a true need for a seabird group for the region? And, if so,

(2) what form should it take?

The outcome of the meeting combined with a widespread telephone census (to canvas the views of principal seabird investigators unable to attend the meeting) was unanimous in the belief that the formation of a seabird group encompassing the geographic area of the northwest Atlantic was highly desirable. Furthermore, the group was of the opinion that instead of forming yet another seabird group it would be better to carefully review existing options. The result of this procedure was the decision to approach the Pacific Seabird Group to determine whether its membership would consider accommodating the needs of Atlantic seabird workers by expanding its geographic area of interest to include the northwest Atlantic. As a member of PSG, I volunteered to take the proposal with me to the Eighth Annual Meeting and present it to both the PSG Executive Council and the general membership.

There is considerable merit in this proposal, not only to those of us in the Atlantic area, but to PSG itself. For some time now PSG has been functioning not only as a forum for the discussion of seabirds inhabiting the Pacific, but for seabirds over a much broader area including the northwest

Atlantic. No better indicator of this exists than the realization that a significant proportion (25-30%) of the present PSG membership reside and work outside the northeast Pacific region. This fact combined with the knowledge that about 22% of the 53 papers given at our 8th Annual Meeting in Seattle this year was from researchers based in eastern North America, as was also the case at our 7th Annual Meeting, when roughly 35% of the contributions originated from the east. All of this is telling us something. In short, it reveals two important facts: first, our name Pacific Seabird Group is not truly representative of our membership; and second, the interests of our membership include not only the marine avifauna of the Pacific but that of the Arctic and Atlantic oceans as well.

I therefore propose that the PSG undergoes a name change (e.g., Marine Bird Society)* in order to: (1) better reflect the overall interests of its members, (2) permit a wider scope of interest concerning the biology and conservation of marine birds and their habitats, and (3) identify and endorse the evolution/direction of PSG over the last decade to its present state of scientific maturity.

David N. Nettleship

*Note: new name to be decided upon by Executive Council (above only one possibility proposed by a member during the business meeting in Seattle).

Ninth Annual Meeting

The 1982 PSG meeting will be cosponsored by the Australasian Seabird Group. The meeting will take place 1-3 December at the Hawaiian Regent Hotel, Waikiki. A block of rooms has been reserved there at $40/night. This room rate will also apply for four days on either side of the meeting days. Members are urged to contact their travel agent early to arrange group air-fares of discount rates. Ward Air (Vancouver) and World Air (San Francisco and Los Angeles) have the lowest regular fares at this time.

Symposium topics will be (1) the ecology of tropical seabirds and (2) human disturbance and effects of predation on seabirds. The symposia will be one-half day each, and we hope to publish them. In addition, we will

have several general paper sessions, which will not be published. Members are urged to preregister for this meeting.

A field trip to Midway Island, 1,200 miles northwest of Honolulu, is planned for 4-7 December. Laysan and Black-footed Albatrosses, Bonin Petrels, Red-footed Boobies, Great Frigatebirds, American Golden Plovers, Bristle-thighed Curlews, White Terns, and Black Noddies are found there in December. There is a good possibility of viewing Short-tailed Albatross, Masked Booby, and Red-tailed Tropicbird. The airfare will be about $400 roundtrip on a military air command flight. A security clearance from the U.S. Navy is required, and interested members should write immediately to Craig Harrison, U.S. Fish and Wildlife Service, P. O. Box 50167, Honolulu, HI 96850, for forms. A full deposit for airfare must be received by October 1.

The Chairman has appointed Stewart Fefer (see list of new members) to be coordinator of the Local Committee for the Hawaii meeting. He will be assisted by other Fish and Wildlife Service employees in Honolulu. Ralph Schreiber has been appointed editor of the symposium proceedings.

Craig Harrison, Program Chairman
Stewart Fefer, Local Chairman

Travel Information for the Hawaii PSG Meeting December 1-3 1982

The least expensive excursion fares from Los Angeles, San Diego, San Francisco, and Sacramento to Honolulu are $420 roundtrip during the week and $440 on weekends. World Airways roundtrip is $350 from Los Angeles and San Francisco.

Some tour packages are available:

A roundtrip airfare and seven nights in a hotel at Waikiki for $470 including:

(1) lei greeting, airport transfers, tour of the city and Punchbowl Crater, tour of Hawaiian garment factory, or
(2) a compact economy car for seven days for $22/person, triple occupancy, or $32/person, double occupancy.

A two-island tour (Honolulu and Maui or Kauai) is $685/person, triple occupancy, and $729/person, double occupancy, and includes airfare and hotel accommodations.

These fares are from San Diego, Los Angeles, San Francisco, Sacramento; from Portland or Seattle subtract $20, from Phoenix add $23, from Denver add $75.

The disadvantage of these package fares is that they cannot be booked for groups and each hotel will sell only five rooms at the package price. These hotels are near the hotel where the PSG meeting will be held.

Group fares are no cheaper than the least expensive excursion fare mentioned first. To charter a plane would be much more expensive.

If you are interested in one of the tour packages, I can send you a brochure on them. I will also be happy to make plane reservations for you which can be paid for by check or credit card. December is a busy time in Hawaii and, obviously, the sooner you make your reservation, the more likely you are to be able to get one of the lower fares, which sell out quickly.

Betty Anne Schreiber, Treasurer
900 Exposition Blvd., Los Angeles, CA 90007

Call for Nominations for 1982

Following are the regional seats on the Executive Council for which nominations are now open:

Alaska, Washington, Northern California, Hawaii, and Mexico.

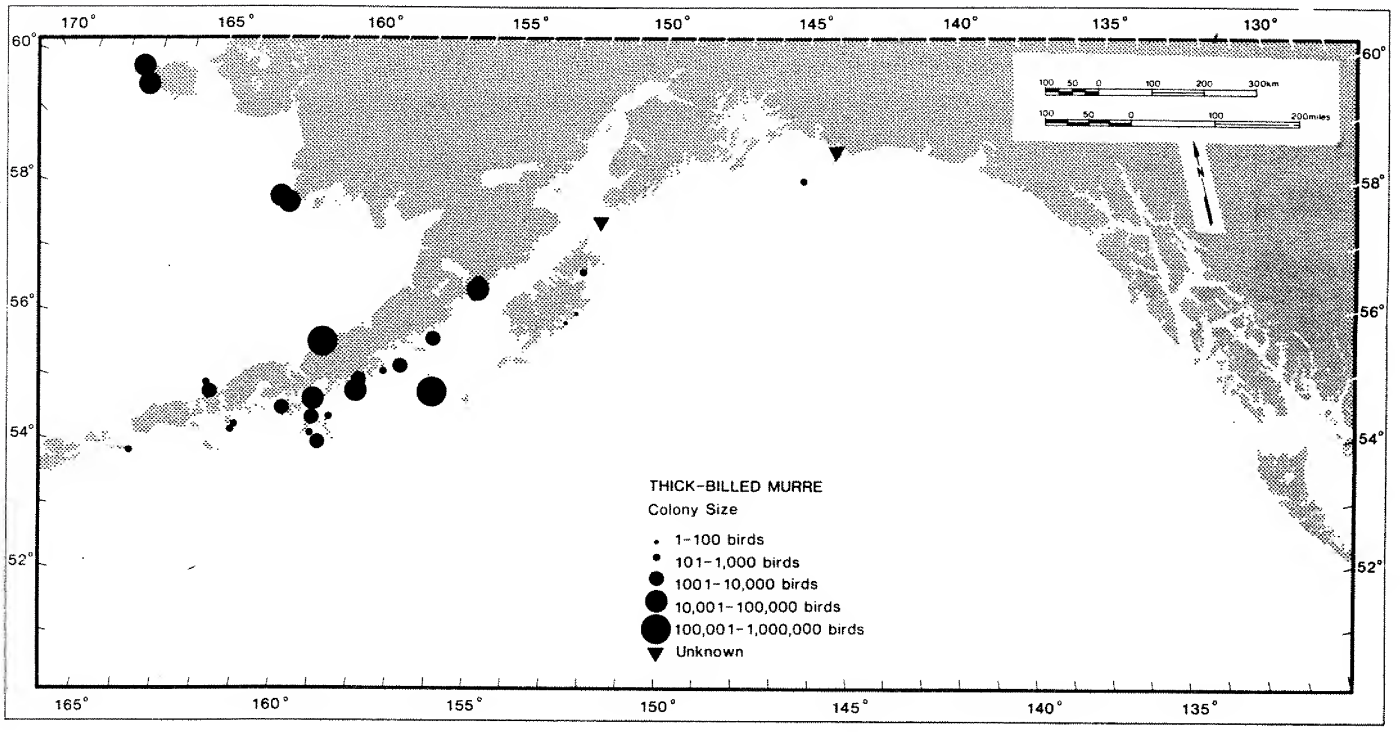
Regional Representatives serve two-year terms on the Executive Council and may continue for successive terms. The nominees must reside in the region for which they are nominated. Regional representatives are expected to (1) contact seabird researchers in their region at least once a year and report all current research in the regional report for the Bulletin; (2) keep abreast of marine conservation issues in their region and report on at least one of the issues in each regional report; send newspaper clippings on important conservation issues to the Chairman; (3) establish and maintain contact

with local conservation groups so that PSG is aware of their activities and they are aware of PSG's; (4) keep copies of all correspondence with seabird researchers and conservation groups.

Although candidates for Chairman-Elect, Secretary, and Treasurer are nominated by the Executive Council, the Council will be glad to receive suggestions for nominations for these offices from the membership.

Send in your nominations right now, before you file your Bulletin and the subject slips your mind! Send nominations (on the enclosed form) by June 1 to:

Dr. P. Dee Boersma
Institute of Environmental Studies
217 Engineering Annex FM-12
University of Washington
Seattle, WA 98195



Proposed Minutes of the Pacific Seabird Group Executive Council Business Meeting, 6 January 1982.

1. The annual business meeting of the Executive Council of the Pacific Seabird Group was held on Wednesday, 6 January 1982, at the Seattle Aquarium, Seattle, Washington. Chairman Vermeer called the meeting to order at 1015 hours.

2. Chairman Vermeer verified that a quorum required for voting was present.

3. Election Committee Coordinator S. Sealy reported the results of the last election:

Chairman:	H. Ohlendorf
Chairman-Elect:	C. Harrison
Secretary:	J. Hand
Treasurer:	B. A. Schreiber
Reps. at Large	J. Bédard
	E. Dunn
	D. Nettleship
B.C.:	K. Vermeer
Oregon:	D. Varoujean
S. Calif:	J. Froke

(Editor's Note. The Chairman has appointed Maura Naughton to fill the seat vacated by Craig Harrison.)

4. A MOTION to waive the reading of the minutes of the 1980 EC meeting was PASSED.

5. Treasurer B. A. Schreiber was absent. Secretary J. Hand presented the treasurer's report. The present balance as of 6 January is $5,025.00.

6. Chairman Vermeer led a discussion of the possible merits of raising membership dues from $5.00 to $10.00 in the face of rising costs for publication and mailing of the Bulletin and our plans to provide partial funding for the symposium in Hawaii in 1982. After discussion, B. Boekelheide MOVED that the dues be increased from $5.00 to $10.00. The MOTION was PASSED.

7. C. Harrison commented on two points:

   (a) Many members in some regions often receive Bulletins and other mailings long after various deadlines have passed. All mailings to foreign countries go first class and we cannot, therefore, improve on their services. To date, however, all mail that has a zip code number (such as U.S. Protectorates) has been sent bulk mail. Incoming Chairman Ohlendorf agreed to find out which of these probably ought to be treated as first class mail.

   (b) Many new members send in money but may not hear further from PSG for many months. At a subsequent meeting of the EC, the suggestion was made that all new members be sent a postcard welcoming them to PSG, informing them of the approximate date of mailing of the next

Bulletin, and giving the location and date of the next annual meeting.

8. Possible topics for the 1982 meeting in Hawaii were discussed. Chairman Vermeer reviewed previous suggestions. In the 1980 EC meeting it had been suggested that since the meeting is to be in Hawaii, an appropriate subject would be the Ecology of Tropical Seabirds. Program Chairman C. Harrison reported that he has made tentative contacts with possible speakers, and several have expressed the desire to participate in such a symposium. A substantial contingent of investigators from the Australia/New Zealand region has also been contacted and would like to attend, and they have expressed a strong desire to have a symposium on Human and Other Animal Impacts on Seabirds. A show of hands of all attending the EC meeting indicated a general consensus that, if possible, the program committee make efforts to accommodate both topics in the symposium. D. Boersma MOVED that we accept the two topics as symposium topics, to be modified by the Program Chairman as needed. The MOTION was PASSED.

9. H. Ohlendorf reviewed several suggestions for the location of the 1983 PSG meeting, including Alaska, California (especially Asilomar), Mexico, and a combined meeting with the Colonial Waterbird Group and possibly even the British and South African Seabird Groups in Florida. A show of hands favored the Asilomar location as first choice and another location somewhere in California as the second, backup choice. At a subsequent, brief meeting of the EC, J. Hand MOVED that the 1983 meeting of the PSG be held at Asilomar, California, in the first week of January 1984 if possible, and that another site in California be selected as an alternative, if necessary. The MOTION was PASSED.

10. Chairman Vermeer led a discussion of the present activities of the various PSG standing committees. The lack of any visible activity by some of the committees was discussed at the 1980 EC meeting in Tucson and was also addressed by J. Strauch on the Editor's Page in the Summer 1981 Bulletin. A number of suggestions were made to the EC, among them the following:

    (a) that written (brief) annual reports to the EC be required from each Committee Chairman at the EC meeting each year, to be published in the Bulletin;

    (b) that the Chairman must more aggressively encourage action by the committees; and

    (c) that the EC, under leadership of the Chairman, should regularly review the status of the committees to see whether they have fulfilled their function and should be terminated or should be assigned new members or a new Chairman when appropriate.

    Incoming EC Chairman Ohlendorf agreed to contact the Chairmen of all standing committees during the next year, asking them to review the status of their committee and make recommendations to the EC for action.

11. The meeting was adjourned at 1230. It was reconvened by Chairman Vermeer at 1745 hours.

12. Bulletin Editor Strauch has received requests from two other bird societies to exchange publications. The problems of where to house such journals and how to make them available to PSG members were discussed. D. Nettleship suggested that we assign individuals to screen relevant publications for articles likely to be of interest to our membership, and that these articles be listed in the Bulletin. No action was taken on this suggestion. It was suggested that the best arrangement to make them available would be to house them in a major library that already has a working interlibrary loan system. D. Boersma agreed to see if the University of Washington Library would be willing to provide this service.

13. The PSG received a request for a donation of about $100.00 to the Aldabra Appeal of the Seychelles Islands Foundation. To date, PSG has not had a policy of donating money to other organizations, and the pros and cons of establishing such a policy were debated. Our funds are already limited; furthermore, such requests would have to be carefully screened; we might soon find ourselves "besieged" by similar requests, and ultimately would be in the position of refusing many worthwhile requests. The general consensus of those in attendance was that we should use other forms of support, one of which can be publishing funding appeals from such societies in the Bulletin. D. Boersma also MOVED that the Chairman of the Sanctuary Committee, P. Sekora, draft a letter of support from the PSG for the Seychelles Islands Foundation's Aldabra Project. The MOTION was PASSED.

14. C. Harrison, Program Chairman for the 1983 Hawaii meeting, suggested that PSG might want to make arrangements for group flights from the Pacific Coast to the meeting. When further information is available about travel arrangements, it will be published in the Bulletin. Members may wish to contact their regional representative about setting up group flights.

15. D. Nettleship reported the results of an 8 December 1981 meeting of a number of seabird researchers working primarily in the northeastern region of North America. The consensus at their meeting was that these individuals - many of whom are already members of PSG - feel a need to form an organized unit specifically embracing northwest Atlantic research. Rather than form yet another seabird group, they asked Nettleship to propose to the PSG the possibility that PSG consider changing its name - which presently suggests a limited interest in Pacific seabirds - to a name that would embrace members of the Atlantic contingent, and to consider making changes in the Bylaws that might be needed to reflect this enlarged perspective. The following were mentioned or discussed:

    (a) In 1973 and 1974, when PSG was formed, there were only four northeast members. Now, 25% of PSG members work outside the eastern Pacific region, and a large percentage of papers presented at meetings also come from areas other than the Pacific.

(b) Name - we might select a very general name and have as many regional chapters as the membership desires (e.g., Eastern Pacific, Australasian, Northwest Atlantic Chapters, etc.). This would allow for unlimited future growth.

(c) Annual Meetings - they would continue to be held in regions having the most members.

(d) We may have grown sufficiently large that the term "society," rather than "group," would be a more appropriate designation if a name change is made.

After discussion, H. Ohlendorf MOVED that we explore the possibility of another name for the Pacific Seabird Group that would recognize the expanding contribution from the northeastern part of North America, and that a description of the proposal, with a ballot to poll the general membership, be included in the next Bulletin. The MOTION was PASSED.

16. The following three RESOLUTIONS were PASSED, the first two introduced by B. Boekelheide and the last by G. Divoky:

RESOLUTION 1. MONO LAKE

WHEREAS, Mono Lake, California, supports large breeding populations of California Gulls and migratory populations of Eared Grebes and Wilson's Phalaropes, and

WHEREAS, diversions of Mono Lake's tributary streams by the Los Angeles Department of Water and Power are causing a decline in the lake's water level which has resulted in an increase in salinity, and

WHEREAS, said decline in the lake's water level has caused the abandonment of the major California Gull nesting site, and

WHEREAS, recent precipitous declines in the nesting success of California Gulls and their food supply raises the serious possibility that the lake is beginning to experience irreversible ecological degradation,

THEREFORE, BE IT RESOLVED that the Pacific Seabird Group recognizes the great importance of Mono Lake for these bird populations in the Western United States and supports the efforts of the National Audubon Society, the Los Angeles Audubon Society, the Friends of the Earth, and the Mono Lake Committee to reduce diversions of Mono Lake's tributaries.

RESOLUTION 2. POINT REYES-FARALLON ISLAND MARINE SANCTUARY

WHEREAS, the Point Reyes-Farallon Island Marine Sanctuary includes the Farallon Islands, the Gulf of the Farallones and waters surrounding the Point Reyes Peninsula, and

WHEREAS, the Farallon Islands, California, support the largest seabird breeding colonies in the contiguous United States and significant populations of breeding and migratory pinniped species, and

WHEREAS, the Gulf of the Farallones is an important migration route and feeding area for numerous migratory species of marine birds and mammals, including the Brown Pelican and the California Gray Whale, and

WHEREAS, oil exploration and development within the Marine Sanctuary boundaries is incompatible with these breeding and migratory species,

THEREFORE, BE IT RESOLVED that the Pacific Seabird Group supports the current suspension of all oil exploration and development within the Point Reyes-Farallon Island Marine Sanctuary and desires that decisions concerning oil development within the Sanctuary remain under the jurisdiction of the National Oceanographic and Atmospheric Administration.

RESOLUTION 3. MEETING ARRANGEMENTS

WHEREAS, the Eighth Annual Meeting of the Pacific Seabird Group has been deemed a great success by the attendants, and

WHEREAS, this success is due in great part to the efforts and hospitality of Lora Leschner and other members of the local committee in cooperation with Gary Ballew and the staff of the Seattle Aquarium,

THEREFORE, BE IT RESOLVED that the Pacific Seabird Group expresses its extreme gratitude to the Washington Department of Game and the Seattle Aquarium for the assistance of Lora Leschner, Gary Ballew, and other staff.

17. D. Siegel-Causey has received correspondence from Russian investigators asking if they might present papers at PSG meetings, to be delivered by proxy since they cannot attend. Two papers at this 1981 meeting were given by proxy and the general consensus of those attending the EC meeting was that this probably would be an acceptable procedure, but no further action was taken on the subject.

18. The EC approved a free membership to Dr. Hsu Wei-shu, Chairman, Department of Zoology, Peking Natural History Museum.

19. The meeting was adjourned at 1920.

20. Addenda: at a subsequent, brief meeting of the Executive Council

(a) D. Boersma was appointed by incoming Chairman Ohlendorf as Election Committee Coordinator for 1982; and

(b) the Council authorized that up to $4,000.00 from PSG funds can be used to help fund publication of the Hawaii symposium, and that additional funding be sought from other sources to increase the number of papers to be included in the publication. In particular, it was agreed that funds should be sought from the Australian and New Zealand societies to help fund publication of papers on Human and Other Animal Disturbances of Seabirds.

Respectfully submitted,

Judith Latta Hand, Secretary

Treasurer's Report: 1981

Beginning Balance - checking and savings account		$5,502.34
Income		
Dues and sale of back issues	$1,988.10	
Interest income on savings	264.92	
Total Income		2,253.02
Outgo		
Expenses for Arizona Meeting, registration services	$ 373.69	
Expenses for Washington Meeting, mailing	192.08	
Funds for Dr. R. Furness to attend Washington Meeting	400.00	
Office Expenses: postage, xeroxing, typing, mailing, labels, phone calls	399.99	
Debit Memos: two bad checks, converting Canadian currency to U.S. currency	16.60	
Bulletin Costs: printing and mailing two bulletins	1,041.81	
Total Outgo		2,424.17
Ending Balance		$5,331.19
Decrease in Balance during 1981	($ 171.15)	

Betty Anne Schreiber, Treasurer

Resolutions

Some members have expressed the desire for PSG to issue more policy statements and resolutions. Two resolutions concerning conservation matters were adopted at the Seattle meeting, but they were discussed only briefly. Regional representatives are responsible for keeping abreast of marine conservation issues in their regions. The Chairman would like those representatives who feel that an issue in their region warrants a resolution or policy statement by PSG to write a draft and send it to Bob Boekelheide (Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, CA 94970) well in advance of the Hawaii meeting. Bob will act as Resolutions Committee Chairman for that meeting and will coordinate the presentation of resolutions at the Executive Council meeting. Resolutions that are approved by the Executive Council will be presented at the business meeting for approval of the members who are present.

Slide Exchange or Sale

Many beautiful and informative photographs of seabirds are shown each year at the annual meeting, never to be seen again. Many members and others would find copies of these photographs useful for their teaching and research. George Divoky (College of the Atlantic, Bar Harbor, ME 04609) would like to correspond with anyone with ideas for establishing a slide exchange among members. Another possibility is that PSG could sell slide sets copied from members' contributions.

Research Techniques

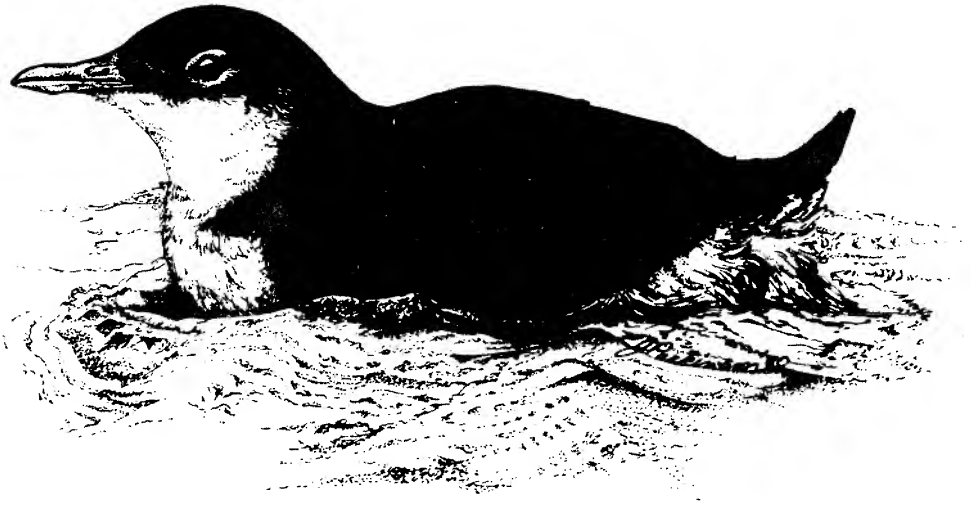
The Editor would like to establish a regular feature in the Bulletin in which members could share research techniques. These should be short notes on a particular technique rather than long reviews of methods. Thus, if you have a trick for trapping it, identifying it, marking it, finding it, or using it, in the field or in the lab, send it along. Please supply your own illustrations.

Results of International Seabird Journal Questionnaire

The Editor received 50 returns, or about one-sixth of the membership responded. Results are:

A.	If the membership dues to PSG were raised to include such a journal, how much would you pay?	$10.00	6
		20.00	27
		30.00	16
		40.00	1
B.	If your membership dues were not affected by a journal subscription but entitled you to subscribe at a reduced rate, how much would you pay?	$20.00	33
		30.00	10
		40.00	3
		50.00	1

Several people added remarks: "Not enough good papers going unpublished to warrant another journal." "Don't do it! I shall be leaving the Colonial Waterbird Group for exactly this reason." "So many new journals are being issued, and prices of existing journals are becoming so high, that many of my colleagues and I cannot afford any new subscriptions." "My answers . . . only apply if the coverage of the 'seabird' journal included related birds, such as shorebirds, using coastal areas." "This journal would be very welcome! Go for it!!" Dave Nettleship and another member noted that some persons belong to more than one seabird group and wouldn't want to pay double for such a journal.



THE PROGRAM CHAIRMAN'S COMMENTS
EIGHTH ANNUAL MEETING
Seattle, Washington
6-9 January 1982
Harry M. Ohlendorf

The Eighth Annual PSG Meeting was a great success. Symposium session chairmen organized informative presentations covering their respective topics. Members contributed several papers for the general session that were related to the symposium topics and to a wide variety of other aspects of seabird biology. Including the symposium sessions, 53 papers were presented at the meeting, and 5 others were included in the poster session. Papers presented in the symposium sessions will be published as a proceedings volume by the Canadian Wildlife Service. We are grateful for this support and appreciate David Nettleship's having made the necessary arrangements.

Lora Leschner and Gary Ballew did a fine job in making local arrangements for the meeting. We appreciate the support of the Washington Department of Game and the Seattle Aquarium, which cosponsored the meeting. The Seattle Aquarium was especially helpful by providing logistical support, space, and free access to their exhibits.

In preparing the Program and Abstracts, I freely used drawings that had previously been used in the PSG Bulletin as well as one or two "originals." I appreciate the artists' work in providing these attractive breaks that appear among the abstracts.

As Program Chairman, my greatest problem was in scheduling speakers so papers were arranged in what I considered the best sequence. A surprising number of abstracts arrived late, and I received some requests for withdrawal or correction of others. Overall, though, the experience was a good one and helped me understand the problems of trying to put together a program.

ABSTRACTS

WINTER FOODS OF BARROW'S GOLDENEYE IN SOUTHEAST ALASKA

Koehl, Philip S., Thomas C. Rothe, and Dirk V. Derksen, U.S. Fish and Wildlife Service, Anchorage, AK 99503

Thirty-eight Barrow's Goldeneyes were collected in four neighboring fjords of southeastern Alaska in February 1980 and 1981. Esophageal and gizzard contents of the birds were examined separately to determine major prey species. Their diets consisted almost entirely of molluscs and crustaceans. Aggregate volumetric percentages of the most frequently found food items were Mytilus edulis, 54.4; Musculus discors, 10.2; Balanus glandula, 10.1; Pagurus hirsutiusculus, 5.3; Margarites spp., 5.1; Littorina spp., 1.2; and algae spp., 0.1. Size of these invertebrates ranged from 2.5 to 37.0 mm (mean 11.3) for Mytilus, 2.2 to 22.2 mm for Musculus, and up to 12.4 mm for Balanus; Pagurus were taken in shells up to 23.3 mm in length.

No difference was detected in diet by age or sex. The numbers of food taxa consumed in 1981 ranged from 5 to 28 among fjords and 1 to 19 among all birds. The number of food taxa in birds from one fjord was 30 in 1980 and only 13 in 1981. Foods may have been selected in relation to tide height.

SUMMER FEEDING ECOLOGY OF HARLEQUIN DUCKS IN PRINCE WILLIAM SOUND, ALASKA

Dzinbal, Kenneth A., and Robert L. Jarvis. Department of Fisheries and Wildlife, Oregon State University, Corvallis, OR 97331

Feeding habitat and time allocated to feeding changed from early to late summer among Harlequin Ducks studied near small coastal streams in Prince William Sound, Alaska, during the summers of 1979 and 1980. In May and early June, paired female and male harlequins fed predominately in the intertidal delta of small streams and in the intertidal zone of protected bays; respectively, they spent about 22 and 12% of their diurnal (0400-2300) time feeding. Following dissolution of pairs in mid-June, harlequins fed mostly in the intertidal delta and lower reach of small streams. After mid-June, both males and females spent about 14-15% of their diurnal (0500-2200) time feeding. Harlequins fed on a variety of marine invertebrates in early summer, but following the arrival of spawning salmon in July, they moved into the lower portions of suitable streams and fed heavily on drifting roe.

PREY SELECTION BY OLDSQUAWS IN A BEAUFORT SEA LAGOON, ALASKA

Johnson, Stephen R. LGL Ltd., 10110-124th Street, Edmonton, AB T5N 1P6, Canada

The feeding ecology of Oldsquaws was investigated during the summers of 1977 and 1978 in Simpson Lagoon, Alaska. Analyses of the esophagi, proventriculi, and ventriculi of actively feeding birds collected systematically throughout both summers indicated that approximately 85% of the diet consisted of mysids (~ 70%) and amphipods (~ 15%). The number of available prey in Simpson Lagoon was relatively small, and the majority of the mysid diet included only two species (Mysis relicta and M. littoralis) and the amphipod diet only one (Onisimus glacialis). The remainder of the diet was mainly bivalves

(Portlandia arctica and Cyrtodaria kurriana). Oldsquaws fed primarily in the deep portions of the lagoon (> 2 m depth), where other research indicated that densities of Oldsquaw prey were greatest. It was shown that Oldsquaws selectively preyed on mysids and amphipods that were significantly larger than the mean size of those same species found in the epibenthos where the birds were feeding when collected. There was a positive and statistically significant relationship showing that Oldsquaws preyed most effectively (more prey found in their stomachs) in areas where prey were most dense; however, predation rates were not investigated.

THE WINTER FEEDING ECOLOGY OF OLDSQUAWS AND WHITE-WINGED SCOTERS IN KACHEMAK BAY, ALASKA

Sanger, Gerald A. U.S. Fish and Wildlife Service, Marine Bird Section, 1011 E. Tudor Rd., Anchorage, AK 99503

The feeding ecology of Oldsquaws and White-winged Scoters was studied on Kachemak Bay from November 1977 through April 1978. These species form the bulk of a large wintering waterfowl population. Oldsquaws were extreme generalists, eating at least 60 prey species; Pacific sand lance and the bivalves Spisula polynyma and Mytilus edulis were most important. Scoters were generalists on molluscs, mostly bivalves. They ate at least 22 prey species; the most important were the bivalves Protothaca staminea and Mytilus, and the small Margarites pupillus. There was little overlap in kinds of prey between the two ducks; when it occurred, prey sizes were significantly different. Both sea ducks generally foraged in water less than 20 m deep, the Oldsquaws over substrates of sand and mud, and the scoters over bottoms of shell debris and cobbles. The base of the food web depends on the production and availability of organic detritus, which may originate largely from winter die-off of extensive kelp beds. However, little is known about ecological processes between kelp production, and production and availability of the birds' filter-and-deposit-feeding prey.

THE WHITE-WINGED SCOTER DIET IN BRITISH COLUMBIA WATERS: RESOURCE-PARTITIONING WITH OTHER SCOTERS

Vermeer, Kees, and Neil Bourne. Canadian Wildlife Service, Delta, BC V4K 3Y3, Canada; Pacific Biological Station, Nanaimo, BC V9R 5K6, Canada

White-winged Scoters are opportunistic and forage in various intertidal and subtidal zones over different substrates. Twenty bivalve and 20 snail species were encountered as prey, which varied between regions. Of the bivalves, six clam species predominated, but mussels were important at one location. Of the snails, only Batillaria zonalis contributed significantly to the scoter's food biomass. Barnacles were by far the most important crustacean food.

The distribution and food of White-winged Scoters were compared with those of Black and Surf Scoters. All three species were found over sand/mud and cobble substrates, while Surf Scoters far outnumbered other scoters in fjords. White-winged Scoters fed on more clams and snails than the other two species, whose diets were composed mainly of mussels. Where scoters fed over or near clam beds, the Surf Scoter partially switched from mussels to Manila

clams (Tapes philippinarum) while the Black Scoter continued to feed primarily on mussels.

FEEDING ECOLOGY OF SEA DUCKS WINTERING IN THE INLAND MARINE WATERS OF WASHINGTON

Hirsch, Katherine V. Nongame Program, Department of Natural Resources, Box 7, Centennial Building, St. Paul, MN 55155

The feeding ecology and habitat use of seaducks wintering in the Strait of Juan de Fuca, Washington, were studied during the winters of 1978-79 and 1979-80. Ducks were censused, and measurements were made of water depth and distance to shore in the areas ducks used for feeding. Ducks were collected, and food contents of the esophagi and gizzards were analyzed. Partitioning of resources occurred through distinct patterns of habitat use. Species used distinctive water depths and distances from shore. Partitioning of resources also occurred through prey selection. Prey types and prey size varied among species studied. Yet there was considerable overlap in diets of Bufflehead-Common Goldeneye, Common Goldeneye-Oldsquaw, Surf Scoter-White-winged Scoter, Bufflehead-Oldsquaw, and Surf Scoter-Common Goldeneye. Data indicate that both resource partitioning and resource overlap (competition) occur in this community of seaducks.

FEEDING ECOLOGY OF BLACK BRANT ON THE NORTH SLOPE OF ALASKA

Kiera, Eileen F. W. U.S. Forest Service, Skykomish, WA 98288

The feeding ecology of Black Brant in their summer habitat was studied on the North Slope of Alaska from May through September 1978. The birds began arriving on the North Slope in late May. Breeding adults set up nesting territories on islands in coastal lakes and rivers. During nesting they fed primarily on mosses, Dupontia fischeri and Carex aquatilis, and spent 22% of the time feeding. Nonbreeders spent the early summer in Arctic salt marshes, where they fed on Carex subspathacea and Puccinellia phryganodes, but before molting they moved inland to lakes where they fed on tundra vegetation. Migrating Brant returned to salt marshes in mid-August just after salt-marsh vegetation reached peak production. Food intake during this time was estimated at 283 g dry weight of vegetation/day. Seventy-seven percent of the daylight hours was spent feeding at an average rate of 83 pecks/minute. In contrast, two human-imprinted geese during feeding trials consumed an average of 340/g/day and spent 65% of the time feeding, pecking at a rate of 90 pecks/minute. Chemical analysis of graminoid samples showed no relation between goose preference and the nutritional characteristics of the vegetation they selected. Grazing pressure on Arctic salt marshes was calculated at 373 goose-days/ha. This is demonstrated to be near the carrying capacity of the marshes without resulting in overgrazing.

WINTER FEEDING ECOLOGY OF MALLARDS AND AMERICAN WIGEON ALONG THE EAST COAST OF VANCOUVER ISLAND, BC.

Eamer, Joan. Institute of Animal Resource Ecology, University of British Columbia, Vancouver, BC V6T 1W5, Canada

Observations of activity and location of dabbling ducks in three estuaries and one shallow bay on eastern Vancouver Island, British Columbia, were made from February to April in 1980 and from October to April in 1980-81. The two major species, Mallard and American Wigeon, fed more intensively at low tide than at high tide, with a high proportion of feeding occurring in shallow water along the marine foreshore and deltas. Estuarine channel edges formed important feeding locations at high tides. Esophageal analyses of ducks shot while feeding at low tide indicated that important food items for wintering and migrating American Wigeon and Mallards include marine green algae and marine invertebrates. Food items important at high-tide levels include seeds and roots of marsh plants, filamentous green algae, and a variety of invertebrates.

SPRING MIGRATION OF BRANT IN NORTHERN ALASKA

Lehnhausen, Bud, and Sue Quinlan. Box 82115, College, AK 99708; Alaska Department of Fish and Game, Fairbanks, AK 99701

Most of the migratory movements of Brant in the Pacific are along the coasts or over water. From 20 May to 14 June we studied migration at Icy Cape on the Chukchi Sea coast. Brant were first seen in numbers on 27 May. We estimated a net northward migration of 39,501. However, only 7% of these birds passed prior to 16 June. Most Brant that migrated after this date were probably nonbreeders going to the Teshekpuk Lake area to molt. Since we saw few early migrants, birds that breed in more eastern areas may not follow the coast. In contrast, along the northeast Alaskan and Yukon coasts more than 24,000 Brant have been recorded in early June. Current evidence does not indicate that birds follow open leads in the pack ice. There is information in the literature that Brant move overland through parts of interior Alaska, but relatively small numbers have been reported.

OLFACTORY BEHAVIOR IN PROCELLARIIFORM BIRDS

Hutchinson, Larry V., Bernice M. Wenzel, and Kenneth E. Stager. Department of Physiology, University of California, Los Angeles, CA 90024

Our earlier work showed that certain procellariiform species are selectively attracted to certain odors at sea from downwind. One of these is cod liver oil. Recent work explores the attractiveness of fractions of cod liver oil extracted by several different solvents. Both heptane- and pentane-soluble fractions were more effective than whole oil in that birds arrived sooner and approached odor sources more closely. The oil fraction in ethanol was far less attractive than either of the fractions or the whole oil. All birds in the study area were identified precisely to species. These data, collected throughout a range of climatic and weather conditions using carefully controlled procedures and systematic protocol of experimental and control stimuli, support the idea that certain procellariiform species respond to olfactory stimulation by odors related to their natural prey. The study is concerned with the credibility of this phenomenon and does not address the question of how such cues might operate in nature.

SOOTY SHEARWATERS IN THE CALIFORNIA CURRENT: DIET AND ENERGY ACCUMULATION

Chu, Ellen W. Center for Coastal Marine Studies, University of California. Santa Cruz, CA 95064

This study assesses the trophic impact and energy budget of Sooty Shearwaters off California by quantifying their foods in Monterey Bay and southern California, and by measuring molt, weight, and fat accumulation in birds collected in Monterey Bay from May through September 1979. Important foods in shearwater ventriculi were juvenile rockfishes, northern anchovy, market squid, and euphausiids. Gizzards contained many beaks of the squids Onychoteuthis borealijaponicus and Gonatus spp. and the octopod Octopus rubescens. The diet varied monthly, with rockfish most common in May-June and anchovies and market squid most common in August-September. Mean body weights of shearwaters increased from 798 g in May to 1,024 g in September. Weights varied directly with changes in extracted fat, which increased from 0.3 g/g lean dry weight in May to 2.3 g/g in September. Water and other body components remained stable. Birds molted completely between May and August; peak feather growth occurred in July. Fattening occurred soon after molt. By the time Sooty Shearwaters leave California waters, they have fat stores similar to those of passerines about to migrate long distances over water.

PELAGIC FEEDING ECOLOGY OF THE SOOTY SHEARWATER IN THE NORTHWESTERN NORTH PACIFIC OCEAN

Ogi, Haruo. Research Institute of North Pacific Fisheries, Faculty of Fisheries, Hokkaido University, Hakodate, Hokkaido, 041, Japan

The overall diet composition by weight of 174 Sooty Shearwaters from the northwestern North Pacific Ocean was as follows: fish, 82.8%; squid, 7.3%; barnacles, 2.9%; jellyfish, 1.2%; and, amphipods and shrimp, 0.04%. The birds showed a marked preference for fish regardless of time and locality. Fish prey included Pacific saury (Cololabis saira), chub mackerel (Scomber japonicus), threespine stickleback (Gasterosteus aculeatus) and rockfish (Sebastes spp.). The squid Berryteuthis anonychus and the siphonophore Velella lata were also taken by the birds. Pacific saury accounted for 70% by weight of all prey; other prey species were of relatively minor importance. Based on the occurrence of saury in the bird stomachs, this fish's northern range limit appears to advance seasonally, going from the northern subtropics in April, into the Transitional Domain in May, the Subarctic Current in June-July, and into the Alaskan Stream just south of the Aleutian Islands in August. From August through October, the reverse occurs. Seasonal movements of Sooty Shearwaters and Pacific saury may be related in the western North Pacific Ocean.

PHALAROPE FEEDING IN RELATION TO AUTUMN UPWELLING FEATURES OFF CALIFORNIA

Briggs, Kenneth T., Kathleen F. Dettman, David B. Lewis, and W. Breck Tyler. Center for Coastal Marine Studies, University of California, Santa Cruz, CA 95064

A joint ship-aircraft-satellite study was undertaken to examine phalarope feeding in relation to the physical processes and biology of upwelling features off central and northern California. Phalarope distribution and

abundance were assessed via aerial survey while the hydrographic characteristics of a large central California upwelling system were measured from shipboard. Phalarope diet was determined from 58 specimens collected at the same time as zooplankton abundance and chlorophyll concentrations were examined.

Phalaropes were most numerous in strong surface thermal and chlorophyll gradients bordering upwelling masses. They fed primarily on euphausiids and copepods, taking whichever taxon was more abundant. Other crustaceans were of lesser importance; plastic particles were commonly ingested. The surface net plankton was dominated by salps and ctenophores, though phalarope prey predominated at stations near the shelf break off Monterey Bay and at a weak convergence near Guide Seamount.

FORAGING PATTERNS OF GULLS IN TWO OCEANS

Pierotti, Raymond. Moss Landing Marine Laboratory, Moss Landing, CA 95039

I studied the foraging behavior and ecology of the Western Gull in Central and Southern California during 1973-75 and again during 1980-81. Similar data were collected on the Herring and Great Black-backed Gull in Nova Scotia and Newfoundland during 1976-79. These time periods included both normal and subnormal years of food availability. All three species fed primarily on pelagic fish and invertebrates during the breeding season. All three species also showed an increase in breadth of diet and in length of foraging bouts during years of low food. In Western Gulls, there was considerable difference between the diets of males and females, but there was almost complete overlap between the diets of males and females of the other species. Observations suggest that gulls forage most efficiently at sea as part of a mixed species foraging assemblage. Gulls also appear to act as scouts or locators of foraging assemblages for other species of seabirds and for marine mammals. No support was found for the idea that interspecific competition acts to structure the foraging patterns of marine birds.

A COMPARISON OF SEABIRD TROPHIC DYNAMICS AT THE ICE EDGE IN THE BEAUFORT, CHUKCHI, AND BERING SEAS

Divoky, George J. College of the Atlantic, Bar Harbor, ME 04609

During its annual formation and decomposition, the western Arctic pack ice occupies three kinds of seas; high arctic (Beaufort), low arctic (Chukchi), and subarctic (Bering). Birds were censused and their stomach contents examined at the Beaufort Sea in summer, Chukchi Sea in summer and fall, and Bering Sea in late winter. Major differences in the species composition, densities, and biomass of the bird community of the three seas were correlated with primary and secondary productivity. Densities in the Beaufort and Chukchi were low (10 birds/km^2), and diving species were absent from the Beaufort and regular but uncommon in the Chukchi. Major prey items in both areas were epontic (under-ice) fish and zooplankton. Bering Sea densities were high (over 400 birds/km^2), and murres predominated. Fish and zooplankton associated with productivity at the shelf break and ice edge were the major prey. Relationships of birds and their prey species to physical and biological environmental parameters are discussed.

A COMPARISON OF SEABIRD DIETS AND FORAGING DISTRIBUTION AROUND THE PRIBILOF ISLANDS

Schneider, David C., and George L. Hunt, Jr.. Ecology and Evolutionary Biology, University of California, Irvine, CA 92717

The link between seabird numbers, seabird productivity, prey populations, and the oceanic environment is likely to be especially strong around breeding colonies. We compared foraging distribution, dietary composition, and prey size at the two Pribilof Islands, which differ in cliff area available to nesting birds, proximity to the shelf break, and the distribution of water masses around each island. We report significant differences in foraging distribution related to water masses. We also report dietary composition and prey size for each island and then relate these findings to recently developed knowledge of the functioning of the Bering shelf ecosystem, through an interagency, interdisciplinary research program (PROBES, Processes and Resources of the Bering Sea Ecosystem).

FISH CHANGES IN THE DIET OF NESTLING RHINOCEROS AUKLETS AND THEIR IMPLICATIONS

Vermeer, Kees, and Jergen Westrheim. Canadian Wildlife Service, Delta, BC V4K 3Y3, Canada; Pacific Biological Station, Nanaimo, BC V9R 5K6, Canada.

The diet of nestling Rhinoceros Auklets was investigated on three islands in British Columbia waters. Prey varied between years as well as within each summer. Major annual variations were the early appearance and predominance of Pacific sauries (Cololabis saira) in 1976; the annual fluctuation in abundance of age groups of sandeel (Ammodytes hexapterus) and herring (Clupea harengus); a drastic annual change in rockfish species; and the appearance of bathypelagic bluethroat argentines (Nansenia) in 1978. Variations over the summer were the predominance of sandeels and rockfishes in July and herring and Pacific sauries in August. Diet changes in composition, age and size of sandeels, rockfishes, Pacific sauries, and bluethroat argentines at Triangle and Pine Islands were synchronized over the years, indicating that the birds fed upon prevailing fish populations in northern Vancouver Island waters that were of the same age group and species each year but differed between years.

NESTLING DIET AND FEEDING RATES OF RHINOCEROS AUKLETS IN ALASKA

Hatch, Scott A. U.S. Fish and Wildlife Service, 1011 E. Tudor Road, Anchorage, AK 99503

Food brought to nestling Rhinoceros Auklets was sampled by applying tape or cloth muzzles to the chicks and collecting uningested food from the burrow daily. Chicks received an average of 34.1 g of food per night at Middleton Island in 1978 and 32.8 g per night at the Semidi Islands in 1979. Together with published mean weights of bill loads in this species, these values indicate that, on average, chicks were visited by only one adult per night. Pacific sand lance comprised the bulk of the diet at both locations. Individual sand lance fell into distinct age-size classes, of which large, age 1 fish predominated in the diet of auklets. In contrast, Horned and Tufted Puffins took small age 0 fish almost exclusively during the same seasons. In Rhinoceros Auklets, the quantity of food delivered per night varied with the

age of the chick; wind speed may be an important environmental factor affecting feeding rates. The relative availability of small and large size classes of sand lance showed variability on several time scales. Implications for birds of such variability in prey population structure are discussed.

RESOURCE PARTITIONING BETWEEN SEVEN HAWAIIAN PROCELLARIFORMS

Harrison, Craig S., Thomas S. Hida, and Michael P. Seki. U.S. Fish and Wildlife Service, P. O. Box 50167, Honolulu, HI 96850; Southwest Fisheries Center Honolulu Laboratory, National Marine Fisheries Service, Honolulu, HI 96812 (Hida and Seki)

One thousand food samples from Black-footed Albatross, Laysan Albatross, Bonin Petrels, Bulwer's Petrels, Sooty Storm-Petrels, Wedge-tailed Shearwaters, and Christmas Shearwaters were collected in the Hawaiian Islands and analyzed by standard laboratory techniques. Samples of this group were further digested than those of terns or boobies, resulting in a large proportion of unidentifiable fish and unidentifiable remains. Ommastrephid squids (Symplectoteuthis sp.) were important for all species. In addition, Black-footed Albatross fed on flying fish (Exocoetidae) ova, shearwaters fed on goatfish (Mullidae), jacks (Decapterus sp.), and flying fish. The Bulwer's and Bonin Petrels ate substantial amounts of the midwater lantern fish (Myctophidae) and hatchet fish (Sternoptychidae), which may indicate nocturnal feeding. Variation in diet composition by season and location were different for many species.

DISTRIBUTION AND FEEDING ECOLOGY OF PARKINSON'S PETREL (Procellaria parkinsoni) IN THE EASTERN TROPICAL PACIFIC

Pitman, R. L., and P. Unitt. Oregon Institute of Marine Biology, Charleston, OR 97420

During the 3000 hours of seabird observations covering most of the eastern tropical Pacific (ETP) the authors made 68 sightings of Parkinson's Petrel. The species is distributed in relatively nearshore waters from at least Guatemala to Peru and extends westward along the equator out to approximately 110°W. Somewhat limited observation during the time when the species is most abundant in the ETP (northern summer) found areas of concentration (1) just off Punta Mala, Panama; (2) an area 150 nm southwest of Galapagos, and (3) near 85°W from 2°N to 2°S. Parkinson's Petrels were usually seen as single individuals; they did not flock with other species of marine birds. Along coastal areas, Parkinson's Petrels were most often seen following boats and feeding on offal. Offshore, they were consistently seen foraging in association with odontocete cetaceans: 26% of the total sightings (from all areas) were associated with a minimum of seven species of whales and porpoise. One collected individual had been feeding on squid driven to the surface by bottle-nosed dolphin (Tursiops sp.).

A COLLAPSE IN CALIFORNIA GULL FOOD SUPPLY AND CHICK PRODUCTION AT MONO LAKE IN 1981

Winkler, David W. Museum of Vertebrate Zoology, University of California Berkeley, CA 94720

In recent times, Mono Lake has supported 30-50,000 nesting California Gulls (Larus californicus). The gulls there feed their young a diet of approximately 85-95% brine shrimp (Artemia monica). In the spring of 1981 shrimp populations were only approximately 10% of normal densities. This reduction in available food, coupled with unseasonably early and hot summer weather, caused pre-fledging chick mortality to exceed 90%. The effect of the reduced food supply on the quality of parental care and the social behavior of the breeding adults will be discussed. While high temperatures probably exacerbated the chick mortality, the decline in food supply is considered to be the ecological factor ultimately responsible for the decline in chick production.

THE BREEDING ECOLOGY OF CASPIAN AND FORSTER'S TERNS IN THE ELKHORN SLOUGH SALTPONDS, CALIFORNIA

Harvey, Thomas E. San Francisco State University, 1600 Holloway Avenue, San Francisco, CA 94132

The reproductive success and food habits of Caspian and Forster's Terns (Sterna caspia and S. forsteri) were studied during the 1978 breeding season in the Elkhorn Slough saltponds, Monterey Co., California. A total of 75 pairs of Forster's Terns and 79 pairs of Caspian Terns nested on eroded levees. A dramatic decrease in pond water level evidently caused temporary abandonment of one Forster's Tern breeding site. Although Forster's Terns initiated egg-laying on 28 May, about one month later than Caspian Terns, both species had fledged all young by the end of July. Caspian Terns had greater hatching and fledging success, but both species produced about 0.85 young/nest. Analysis of rejected prey and regurgitated pellets revealed that Caspian Terns utilized fishes occurring in Elkhorn Slough, inshore coastal areas, and nearby rivers. Forster's Terns foraged primarily in Elkhorn Slough and nearby brackish estuaries. Most of the fishes taken by the Forster's Tern also occurred in Caspian Tern samples. However, the diet of the smaller tern was evidently dominated by juveniles of fewer fish species. The two terns were found to exploit peaks of several fish species which utilize Elkhorn Slough as a spawning or nursery area.

FACTORS INFLUENCING THE BREEDING SUCCESS OF THE TUFTED PUFFINS ON TRIANGLE ISLAND, British Columbia

Vallée, J. Anne. Department of Animal Science, University of British Columbia, Vancouver, BC V6T 2A2, Canada

During the summer 1980, we studied the Tufted Puffins nesting in high density among different concentrations of nesting gulls. In 1981, we also compared productivity of high- and low-density nesting areas of puffins.

The availability of food varies both between and within years. Phenology was earlier and hatching success was greater in 1981 than 1980 in the high-density area, but chick growth and survival were greater in 1980. The

critical period of losses was during incubation and hatching. We suggest that a decrease in food availability at this time can influence parental attendance and increase risks of chilling or predation by mice or gulls. Hatching success was lower in the low-density areas (in 1981) but we do not know if this is caused by a difference in "bird quality" or in density of predators.

BREEDING BIOLOGY AND BEHAVIOR OF THE ENDANGERED DARK-RUMPED PETREL

Simons, Theodore R. Wildlife Science Group, College of Forest Resources, University of Washington, Seattle, WA 98195

The Hawaiian Dark-rumped Petrel (Pterodroma phaeopygia sandwichensis) or 'Ua'u is an endangered gadfly petrel that nests in the Hawaiian Islands and ranges throughout the central Pacific. The species was once common in Hawaii with large colonies located on all of the main islands, but it has recently been reduced to several small remnant populations. Over 85% of the breeding birds known today nest in and around Haleakala National Park on the Island of Maui, the site of a three-year study begun in 1979. Initial findings indicated a serious predation problem, with over 80% of the breeding failures in 1979 resulting from predation by feral cats and mongooses. Reproductive success improved in 1980 and 1981 with the initiation of a predator control program. The biology of the species will be outlined, emphasizing the adaptations of breeding birds to nesting at an elevation of 3000 meters and the conservation needs of the remaining populations.

TIME SHARING OF INCUBATION AND CHICK BROODING IN COMMON MURRE PAIRS

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The pattern of time-sharing of incubation and chick brooding in the Common Murre Uria aalge was studied on the Gannet Clusters, Labrador, using pairs in which one bird was bridled and one was not. The principal findings were that the frequency of changeovers at the breeding site differed significantly between the incubation and chick-rearing periods, and that in both periods the frequency of changeovers was greatest in the first hours before sunset. This daily pattern, however, was sensitive to inclement weather, which changed both the frequency of changeovers as well as the timing of the peak changeover periods. The mean number of changeovers per pair per day was about 1.4 during incubation and 3.6 during the chick-rearing period. The frequency of changeovers tended to decrease as incubation proceeded and then to increase throughout the chick-rearing period. The lengths of the incubation shifts showed a bimodal distribution, with shifts tending to be either 6-12 hours or 20-28 hours, reflecting the bimodal pattern of daily changeovers. During the chick-rearing period the average shift at the breeding site was 6-7 hours, with no apparent bimodal distribution in times.

AGE-RELATED AGGREGATION BEHAVIOR IN SOOTY TERN CHICKS

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Sooty Tern chicks (Sterna fuscata) on Tern Island, French Frigate Shoals, exhibit three different patterns of spatial distribution from one week after

hatching to fledging. From one to four weeks of age, the chicks form a close-knit crèche, under cover if it is available. Chicks of four to six weeks stand at their own nest site. Chicks near fledging form loose aggregations on beach crests or other windswept areas during the day. The size of chicks in crèches corresponds well with size of chicks vulnerable to Great Frigatebird (Fregata minor) predation as determined by observation and pellet analysis. Daily onset and cessation of crèching behavior was recorded in conjunction with light level, substrate temperature, and wind speed. Group formation is correlated with observed temporal patterns of Great Frigatebird predation. Aggregation of older chicks appears to have thermoregulatory and social functions. Operative environmental temperatures of juvenal plumaged birds were measured in sunny, shady, windy, and sheltered areas. Selection for reproductive synchrony is strong, with most birds that laid early or late in the season losing their eggs to Ruddy Turnstones (Arenaria interpres) or their chicks to Great Frigatebirds.

PREDATION OF Larus occidentalis livens ON Larus heermanni CHICKS AND ITS RELATION TO THE HEERMANN'S GULL'S NESTING DENSITY AND SYNCHRONY

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During the breeding season of the Heermann's Gull in Isla Rasa, observations were made on the predation of the chicks of this species by the Western Gull. Only four pairs of Western Gulls were nesting on the island; however, the number of Western Gulls present was related to the proportion of Heermann's Gulls' nests with chicks. It was also found that the rate of predation attempts, predation successes, time invested in prey search, and predation efficiency were all related to the proportion of nests with chicks. These rates reached a maximum at about the time most chicks had hatched, after which time, they decreased slowly as the chicks increased in size, and Western Gulls, which capture them while flying down on the colony, could no longer lift them in flight. Substrate type, which influences nesting density, plays a major role in predation efficiency, the latter being highest at lower nesting densities.

ECOLOGICAL VARIATION IN THE THIRD CHICK PHENOMENON IN GULLS

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It is generally accepted that in gulls, the third-laid egg is significantly smaller and lighter than the first- and second-laid eggs. As a result, third chicks hatch at a lighter weight, grow more slowly, and have a higher mortality than their siblings. This result is generally assumed to be an evolutionary response of the female gull to minimize expenditure on a chick whose chance of survival would be low in a poor food year. Data collected on the Western Gull on Southeast Farallon Island and on the Herring Gull in Newfoundland supported this idea. However, data collected in a small colony of Western Gulls at Moss Landing, California, showed that third-laid eggs in this colony were as large and heavy as their earlier-laid counterparts. Hatching weights and growth rates of these chicks were also very high. We suggest that this result is due to the locally abundant food supply available to this population. We propose a hypothesis for the evolution of prehatching parental investment based on environmental variability.

SEXING OF FARALLON WESTERN GULLS BY SIZE, AND THEIR AGE/SEX-RELATED PATTERNS OF MOVEMENT DURING 1979-81

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Male Farallon Western Gulls (FWG's) are significantly larger than females. The degree of confidence to be expected when sexing FWG's by observing differences in body size was tested. During 1978-81, 309 banded adults were sexed by behavior while they occupied territories; the band number of each gull was also read with a spotting scope. During 1978-81, 204 of these adults were seen away from their territories and their bands were reread. One hundred seventy (83%) were sexed by observing their size. Their sex, as determined by size, was compared to their sex as previously determined from behavior. It was found that gulls could be reliably sexed with only minor error (< 5%). Error < 5% was also observed for FWG's sexed by size as subadults. These birds were later sexed by behavior as territorial adults. Banded FWG's of less than ½ year of age were not sexed, but their bands were read often. Many were seen later when size-determined sexing was possible. Thus, a study of FWG age/sex-related movements was conducted during monthly coastal censuses along the California and Oregon coasts from 1979 to 1981. Results represent 7,603 band readings of 2,836 known-age, sexed FWG's of 10 hatching years. Females moved farthest, particularly during northern summer movements of their first three years. Males became relatively sedentary in their third year. Other trends in FWG movements will be presented.

'NORTH-SOUTH DIALOGUE' AND GREAT LAKES HERRING GULLS

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An average chick condition index is routinely calculated for a number of Great Lakes Herring Gull colonies. A pattern of 'rich' versus 'poor' colonies emerges, and, interestingly, this pattern is fixed from year to year. An attempt is made to model this pattern with the help of a few predictors, such as proximity to sewage outfalls, refuse tips, and population centers, as well as the local limnological productivity, as measured by a modified morphoedaphic index.

DDT EFFECTS ON DEVELOPMENT OF GULL EMBRYOS: TOXICITY AND FEMINIZATION

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Gulls in southern California and the Great Lakes have historically been exposed to high concentrations of organochlorine pollutants (OCP). Breeding colonies in both areas have exhibited decreases in breeding populations, adult sex ratios skewed toward female, and female-female pairing with incidences of super-clutches ranging from 5-14% of nests. Since population decreases of gulls occurred about five years after breeding failure of Brown Pelicans and cormorants, we hypothesize that the unusual breeding biology could result from developmental abnormalities caused by exposure of embryos to pollutants. Two hundred ninety-two eggs of California and Western Gulls were injected with compounds; 108 survived to hatching. Twenty-eight eggs were damaged or became infected, 119 had early dead embryos or were

infertile, and 36 died during mid-incubation. The mortality was not random. Fifty or 100 ppm DDT, DDE, or methoxychlor caused significantly higher mortality than controls. One hundred ppm estradiol (E_2) killed all embryos. E_2 was 50-100 times as potent a feminizing agent as any OCP. Feminization resulted from o,p'-DDT[2] at doses as low as 2 ppm. The possible metabolites responsible will be discussed.

ATTENDANCE PATTERNS OF NORTHERN FULMARS AT PRINCE LEOPOLD ISLAND, NORTHWEST TERRITORIES, CANADA

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Colony attendance of Northern Fulmars Fulmarus glacialis was examined at Prince Leopold Island (74°02'N, 90°00'W), Northwest Territories, during three consecutive breeding seasons, 1975-1977. The attendance pattern of all fulmars at the colony is described, as well as the contributions to the overall pattern of birds of known status (breeders, failed breeders, and nonbreeding site-holders). Both breeders and nonbreeders arrived at the colony between mid-April and the beginning of May, but departed on a two-week exodus immediately prior to egg laying. During incubation and hatching, major oscillations in attendance took place due largely to the synchronized movements of nonbreeders and failed breeders. The numbers of breeders at the colony during this time remained relatively constant. Numbers of all birds began to decline in early August and continued to do so until the final departure in late September.

MODELLING RELATIONSHIPS BETWEEN FISHERIES, SEABIRDS, AND MARINE MAMMALS

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Calls for culls of seals or seabirds to increase fishery yields have been based on projection of captive studies of food intake to field populations. Such estimates make a number of unsupported assumptions and lack statistical confidence limits. More precise computations can be made, based on generalized bioenergetics equations. Modelling indicates that seabirds in several ecosystems consume 20-30% of annual pelagic fish productions, so are potentially in competition with commercial fisheries. Such estimates require sound knowledge of population size and flux, activity budgets, foraging ranges and diets, as well as data on fish production. Partitioning fish consumption between competing interests does not in itself allow predictions of detailed changes that will result from human manipulation. For example, seabirds in the southern Benguela system are important fish predators. They currently take 20% of the VPA estimate of pelagic fish biomass each year. Overfishing has reduced these pelagic fish stocks and led to declining seabird numbers. While Cape Gannets, with large potential foraging ranges, have been little affected, Jackass Penguins, which can only swim short distances to feed, have seriously declined.

SEABIRD RESPONSE TO NORTHERN ANCHOVY IN SOUTHERN CALIFORNIA: ARE UTILITY AND CONSERVATION COMPATIBLE?

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When considering potential seabird-fishery interactions, there are four major issues: (1) negative competitive interactions by man on seabirds and their implications for seabird conservation, (2) seabirds as indicators of general environmental "health," (3) seabirds as indicator species of some utility in resource management or as environmental monitors for some specific prediction, and (4) negative competitive interactions by seabirds on man, and, again, conservation implications. In Southern California Bight, where a limited prey base (in comparison with that of other areas) exists, breeding success of Brown Pelicans and Western Gulls is known to respond mostly to changes in northern anchovy abundance, barring, of course, random or unnatural environmental events of a catastrophic nature. Changes in reproductive success often predict or track a resource such as anchovies, but seabirds would also likely be affected by changes caused by extensive commercial fishing activities. As would be predicted in most marine upwelling systems studied to date, the two aspects of marine bird ecology (conservation of birds and utility to fisheries) seem therefore largely incompatible. Seabird conservation cannot, therefore, be justified by their utility as indicator species for a specific purpose, except that certain aspects of their ecology do suggest the general stability or instability of coastal ecosystems and man's impact.

SEABIRDS AND FISHERIES IN THE EASTERN PACIFIC BOUNDARY CURRENTS: CALIFORNIA AND PERU

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Fishery-seabird interactions must be considered within the context of natural environmental variability. The anchovy-sardine forage base is highly variable, and is further destabilized by interspecific gamete predation and selective harvesting. Sardine-dominated regimes appear to be shifted poleward, indicating underlying environmental differences.

Seabirds of California and Peru show different life strategies due to patterns of food availability. In Peru, food is usually abundant, allowing maximal reproduction, but occasionally it is so scarce (during El Niño) as to reduce adult survival. In California, food shortage often limits reproduction but seldom limits adult survival. Breeding colonies tend to be located where food is abundant and fluctuations are buffered (also good areas for fishing). Reproductive success decreases sharply below a threshold forage availability. The effect of fisheries on seabirds is difficult to predict quantitatively. Density-dependent compensatory mechanisms are poorly known. Fishery management should avoid prolonged low fish abundance by a precisely controlled harvest; this also maintains anchovy-sardine diversity. Peruvian guano deposits may have been a natural nutrient buffer against the effects of El Niño on ocean productivity. Maintenance of a minimum guano base may be indicated.

POPULATION DYNAMICS AND FOOD RESOURCE UTILIZATION OF SEABIRDS IN SOUTH AFRICA AND NAMIBIA

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Pelagic schooling fish (mainly pilchards, anchovies, and horse mackerel) are the principal prey of Jackass Penguins, Cape Cormorants, Cape Gannets, and the local fishery industry. Intensive fishing by man began in the 1940's, reached a peak harvest in the late 1960's, and caused significant declines in the stocks and mean age composition of the fish. Seabird populations fluctuated over the past 80 years, but showed significant declines since the late 1960's, correlated with reduced fish stocks. We discuss possible limiting factors of seabird populations prior to intensive fishing by man and since its onset. Recent changes in the diets of seabirds from certain areas are assessed. Seabird feeding ecology in southern Africa is still poorly known but considerable research is in progress.

SEABIRD-FISHERIES RELATIONSHIPS IN THE NORTHEAST ATLANTIC AND THE NORTH SEA

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Bioenergetics modelling indicated that seabirds consume 29% of pelagic fish production with a 45-km radius of one Shetland colony. Assuming this is typical, it implies that seabirds, predatory fish, and industrial fisheries are in direct competition. Overfishing of whitefish stocks in the North Sea began in the 1880's and, coupled with more recent reductions of herring and mackerel stocks, led to an increase in populations of small food fish, particularly sandeels. Most seabird species have increased in numbers in Scotland since 1900, probably largely in response to the increased availability of food resulting from these ecosystem changes. Rates of increase have been higher in areas where sandeels have become most abundant. Seabirds breeding in Shetland feed mainly on sandeels and have increased many times faster than the populations of the same species on St. Kilda, an area where fishing pressures have been much lower and seabird diets are more varied. Large scavenging species in Shetland, particularly Herring Gulls, Great Skuas, and fulmars, are dependent on refuse from whitefish boats. Current trends to reduce volumes of whitefish discarding and increase industrial fishing for sandeels are likely to reduce food availability to seabirds. Monitoring will be necessary to determine which aspects of life history are affected by this.

CAPELIN AND SEABIRDS IN THE NORTHWEST ATLANTIC

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Capelin are central to the food webs of fish, marine mammals, and seabirds in low arctic waters in the northwest Atlantic. A major international commercial fishery for this species developed there in the 1970's, and by the end of the decade it was clear that the populations on the Grand Banks, where the fishery takes adult fish before they can spawn, had collapsed. This has had significant effects on capelin-dependent species. For example, Atlantic

Puffins in southeastern Newfoundland, where more than 70% of the North American population reproduces, failed to breed successfully in 1981, apparently because capelin availability was low and the nutrient content of the only alternative prey, small gadoids, was inadequate for chick growth. This situation is compared with that of a colony at Røst, northern Norway, where similar breeding failure followed overfishing of the immature herring populations, and on St. Kilda, Scotland, where the birds were apparently able to find alternative prey of suitable quality and thus buffered the effects of fluctuations of prey availability. Other capelin feeders such as the two murre species and Razorbill were probably similarly affected by the collapse of capelin spawning both inshore and offshore. In general, it appears that the seabirds most vulnerable to pressure from overfishing are the specialized pursuit divers, as opposed to birds which feed on the surface or by plunging in from the air.

CAPELIN IN THE NORTHWEST ATLANTIC: PAST, PRESENT, AND FUTURE

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Capelin (Mallotus villosus) is considered to be one of the most important fish species in the northwest Atlantic because of its commercial importance and its position as a forage species. Aspects of capelin biology including distribution, spawning, migration patterns, stock discrimination, population biology, and its position in the trophic structure of the northwest Atlantic are reviewed. The offshore commercial capelin fishery began in 1972, peaked in 1976, and has declined since then. The pattern of the commercial fishery and its management are reviewed. The status of capelin stocks has been determined by surplus production models, acoustic techniques, and analytical models, and the results of these techniques, their advantages and disadvantages, and problems in capelin stock assessment are presented. Future research requirements relating to capelin management and species interactions are discussed.

MARBLED MURRELET MORTALITY AND A GILL-NET FISHERY IN BARKLEY SOUND, BRITISH COLUMBIA

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Alcid mortality due to inshore commercial fishing seldom has been examined, and little is known of how it occurs and its effect on local populations. During studies of a breeding population of Marbled Murrelets in Barkley Sound, British Columbia, in 1979-80, we obtained information on alcid mortality due to a local sockeye salmon (Oncorhynchus nerka) fishery. The Marbled Murrelet was netted most frequently and was the most abundant alcid present. The fishing season coincided with the murrelet's nestling period, and the distributions of fishing boats and feeding murrelets were concentric. The resultant mortalities occurred mainly at night in South Trevor Channel. Mortality is significant, at least over the short term, although it is difficult to monitor. Other effects of the fishing and logging industries in this area may increase or decrease mortality over the long term.

A MODEL OF COLONIAL SEABIRD POPULATION DYNAMICS AND ENERGETICS

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A joint study team of seabird ecologists, fisheries biologists, and ecological modelers has developed a simulation model of the population dynamics and breeding season energetics of a generalized seabird colony. Components of the model include: (a) simulation of distribution and abundance of potential schools of prey; (b) decision rules to optimize foraging choices of seabirds given status of (a) and flight costs; (c) schedule of egg production and loss; (d) chick hatching, growth rates, respiration rates, and mortality to environmental stress and predation. The model has been parameterized for Newfoundland colonies of the Common Murre (Uria aalge), using data from published and unpublished sources on murres and their dominant prey species.

We describe the general structure of the model and aspects of its ontogeny to emphasize the successful interactions among university, governmental, and corporate researchers. We also present results of test simulations of the model, addressing the question of optimal fledging time for murre chicks, to illustrate the usefulness of the model to ecological investigations.

MORTALITY OF ALCIDS BY DROWNING IN FISH NETS IN NEWFOUNDLAND

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Analysis of Common Murre (Uria aalge) band recoveries over 26 years (1951-77) and three surveys of seabird bycatch in nearshore fishing gear (1972, 1980, 1981) have revealed much about the nature of seabird net-mortality in Newfoundland, including species and numbers affected, oceanographic distribution, timing, type of fishing gear involved, and causal and/or contributing factors. The majority of net-mortality incidents occurs during the inshore spawning migration of Capelin (Mallotus villosus), a major food for many Newfoundland seabirds, particularly murres (Uria spp.) and Atlantic Puffins (Fratercula arctica). The net mortality data, in conjunction with field observations and autopsies of net-drowned birds, also provide some insight into the foraging behavior of alcids in Newfoundland waters (e.g., diving depths, prey size, feeding flock sizes and associations, etc.).

MURRE NET-MORTALITY AT WEST GREENLAND

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In the late 1960's and early 1970's, a high net-mortality of seabirds, particularly Thick-billed Murres, was associated with the West Greenland salmon fishery. The non-Greenlandic offshore driftnet fishery was phased out in 1975, and since 1972, the domestic fishery has been controlled by quotas and fishery opening dates. These restrictions probably resulted in a substantial decrease in murre net-mortality. However, the Greenlandic fishery has

changed considerably since 1972, when seabird bycatch was later examined in detail. Fishing vessels now use monofilament nylon nets; fishing effort has redistributed closer to murre colonies; and intensive driftnetting occurs offshore. These factors, combined with a change in 1981 to a later fishing season, have probably resulted in a renewal of significant murre net-mortality at West Greenland.

DISTRIBUTION OF WESTERN GREBES IN WASHINGTON'S INLAND WATERS WITH REFERENCE TO COMMERCIAL FISHING OPERATIONS

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The Western Grebe is one of the most abundant diving birds wintering in Washington's inland waters, which apparently represent one of the most important parts of the species nonbreeding range. It is one of the species suffering mortality due to oiling and entanglement in fishing nets. Western Grebe flocks tend to concentrate in deeper embayments and protected channels and to be consistent in location from year to year. Recent changes in fishing techniques may reduce mortality of some other diving birds while increasing that of Western Grebes.

THE ANNUAL CYCLE OF SHOREBIRDS AT GRAYS HARBOR, WASHINGTON

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Censuses of shorebirds were taken on the north side of Grays Harbor, Washington, at intervals over a period of nine years. From these censuses an overall picture of seasonality can be painted for 25 of the 37 species recorded. Spring migration occurs as a narrow pulse of about a month's duration, with very large daily counts for Western Sandpipers, Dunlins, and Short-billed Dowitchers. Up to 500,000 birds use the area at one time in late April, the largest concentration of shorebirds on the Pacific coast south of the Copper River Delta in Alaska. Fall migration occurs over a much longer period, taking about four months for all species to move through the area. Because of this, many species appear to be more abundant in spring than in fall, their entire populations appearing almost simultaneously. Other species have higher daily counts in fall, most of them species in which only juveniles regularly migrate through the area. A surprising early and substantial fall movement of Western Sandpipers, Short-billed Dowitchers, and Whimbrels must be composed of birds that bred unsuccessfully and/or deserted their mates at hatching, and moved south extremely rapidly.

SEASONAL ABUNDANCE, DISTRIBUTION, AND ORIGIN OF COMMON MURRES IN WASHINGTON

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Censuses and other observations of Common Murres were made at various sites along the coastal and inland marine waters of Washington. The present breeding population, all on the outer coast, is 21,000 pairs. Peak numbers of murres observed in September may reach 240,000 individuals in the Strait of Juan de Fuca. Murres are observed moving northward along the Washington coast during post-breeding dispersal, which suggests that the large numbers in Washington originate from Oregon or as far south as the Farallon Islands. Seasonal changes in numbers and habitat preferences are also presented.

BREEDING DISTRIBUTION AND NOCTURNAL HABITS OF WHISKERED AUKLETS IN THE EASTERN ALEUTIAN ISLANDS

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Whiskered Auklets were found breeding on 33 of 68 islands surveyed in 1980-81 in the eastern Aleutian Islands. At least 13 other islands were thought to have breeding Whiskered Auklets. Prior to this survey, only 10 breeding sites were known for all of the Aleutian Islands.

Whiskered Auklets are nocturnal nesters, frequenting rock crevices of cliffs in a low-density pattern similar to that of Horned Puffins. Whiskered Auklets give a loud, characteristic call when at the nest site. We suggest that these calls may be an adaptation to low-density nesting by aiding in locating the nest of mate, especially on foggy nights. Flocks of hundreds and occasionally thousands of auklets are regularly found during the day in southeastern Avatanak Strait and Akutan Pass. The highly clumped distribution makes this rare auklet vulnerable to oil spills or other local disturbance.

ABUNDANCE AND DISTRIBUTION OF BREEDING SEABIRDS IN THE EASTERN ALEUTIAN ISLANDS, 1980-1981

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Sixty-eight islands in the eastern Aleutian Islands located between Unimak and Samalga passes were surveyed for breeding seabirds during the summers of 1980 and 1981. These surveys revealed that at least 2,000,000 seabirds nest in this region instead of the 600,000 estimated by past surveys of the U.S Fish and Wildlife Service. This difference is due to a combination of more intensive surveys and the disappearance of introduced foxes from most of the smaller islands.

The numerically dominant species include 1,195,000 Tufted Puffins, 344,000 Fork-tailed Storm-Petrels, 234,000 Leach's Storm-Petrels, 42,000 Glaucous-winged Gulls, 33,000 Ancient Murrelets, 18,000 Cassin's Auklets, and a minimum of 402 breeding Whiskered Auklets. At least 46 of the islands have three or more species of nesting nocturnal seabirds, and many islands have five.

CHRONOLOGY OF THE OFFSHORE MIGRATION OF SOOTY SHEARWATERS IN THE EASTERN PACIFIC

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The population of the Sooty Shearwater in the Pacific Ocean is drawn from two different breeding areas: Australasia and the Cape Horn archipelago. We shall discuss the migratory pattern of the Cape Horn population. Upon departure from the breeding grounds, shearwaters move northward along the Humboldt Current. The equatorial crossing remains poorly understood but involves widespread movement over open ocean away from the coastlines of northern South America, Central America, and Mexico. The eastern fringe of this migratory movement is seen on feeding grounds off the California coast.

Arrival in California waters occurs in migratory waves which are probably related to age groups. Most birds, after arriving in California, move northward, crossing the Gulf of Alaska to their wintering grounds. Pre-breeding migration southward occurs over one short period rather than in successive waves.

DISTRIBUTION AND ABUNDANCE OF BREEDING SEABIRDS ALONG THE SOUTH SIDE OF THE ALASKA PENINSULA BETWEEN JUTE AND KAMISHAK BAYS

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A reconnaissance of islands and cliffs along the Becharof National Wildlife Refuge and Katmai National Park, situated on the northeastern end of the Alaska Peninsula, was conducted in July 1981. Excluding Kittlitz's and Marbled Murrelets, approximately 50,000 pairs of seabirds representing 17 species were estimated on the approximate 500-km survey of about 50 islands and mainland cliffs. Almost 90% of the region's seabirds nest on cliffs in the Puale Bay area and on Ninagiak Island. Common Murres accounted for 74% of the colonial nesting species. Glaucous-winged Gulls nested at 31 sites and totalled over 4,400 pairs. Tufted Puffins nested on 11 islands and outnumbered Horned Puffins roughly 3 to 1. Although Red-faced Cormorants were the most common of the three nesting species, Pelagic Cormorants were more widely distributed. Black-legged Kittiwakes bred at seven locations, and only one Parakeet Auklet colony was found. No nocturnal species breed in this region. Kittlitz's and Marbled Murrelets were common in certain bays. Brown bears frequent nearly all the islands and are believed responsible for the absence or paucity of seabirds on most islands. Probably because of the abundance of bears, no islands in this area were reportedly used for fox farms.

BREEDING SEABIRDS OF THE FAR NORTHERN GULF OF CALIFORNIA

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The major seabird colonies of the northernmost Gulf of California are on Roca Consag (31°10'N 114°30'W) and Islas San Jorge (31°01'N 113°10'W). Islas San Jorge, the more accessible colony, was censused four times during April-August 1981. Approx. 6-7000 breeding pairs of the Gulf Brown Booby (Sula leucogaster brewsteri) were counted in mid-April; most of the juveniles had fledged by the end of May. By late June, adults had started courtship and nest building. A few eggs were noticed by early August. Heermann's Gulls nested in much lesser numbers (approx. 300 breeding pairs) and were still incubating eggs by late May. Two pair of tropicbirds built nests in a shallow overhang on the southernmost island. Roca Consag did not appear to have any breeding birds on it in late August, but remnants of nests and egg fragments suggest that there were some attempts. Both locations support large numbers of transient Brown Pelicans, Double-crested Cormorants, Western Gulls, and others. Evidence from field observations and oceanographic studies suggests that this region supports at least two breeding shifts of Brown Boobies each year.

DIETARY COMPOSITION OF BROWN PELICANS BREEDING IN THE SOUTHERN CALIFORNIA BIGHT

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Dietary composition as determined from regurgitations of prefledged California Brown Pelicans (Pelecanus occidentalis californicus) collected in 1972-80 from three colonies in the Southern California Bight (SCB) indicated dependence on northern anchovy (Engraulis mordax). That fish species comprised 89% of 4396 fish identified and 80% of the estimated prey biomass. Northern anchovy represents the dominant available surface-occurring, schooling fish in the SCB. We conclude that this single species is the only food source which currently meets the requirements of breeding pelicans in the SCB. Between 1979 and 1980, however, there was an increase in Pacific mackerel (Scomber japonicus) incidence in pelican food samples (n = 11 individuals in 1979 and 30 in 1980), possibly associated with a recent increase in abundance of that species. More data are needed, however, to confirm such a trend if it exists and if our studies continue.

INFLUENCES OF SEA OTTER PREDATION ON FORAGING STRATEGIES OF GLAUCOUS-WINGED GULLS ON ATTU ISLAND, ALASKA

Irons, David B. Oregon Cooperative Wildlife Research Unit, Oregon State University, Corvallis, OR 97330

Diets and foraging strategies of Glaucous-winged Gulls were studied in areas with and without sea otters. Sea otters affected foraging strategies and diets of gulls by reducing the size and density of intertidal prey, and therefore, net rate of energy gain (En) to gulls. In the presence of high densities of sea otters, gulls shifted their diets from a predictable prey resource (intertidal invertebrates) to an unpredictable prey resource (fish), and the diversity of their diets was reduced. These changes in diets of gulls indicated that competition for food may occur between sea otters and gulls. Gulls selected to forage in particular intertidal zones for specific prey species and prey sizes. Selective foraging increased En of gulls 139% and 66% in areas with and without sea otters, respectively. Prey preference experiments demonstrated that preference of gulls for prey was significantly correlated to En, but assimilation rate, experience, and search images also influenced prey preference. Foraging behavior of gulls indicated that gulls hunted by En expectation and left prey patches when a threshold En was reached. Foraging of gulls in the rocky intertidal supported optimal foraging theory for optimal diets, patch choice, time allocation to patches.

POSTER SESSION

A REVISED MODEL OF THE MIGRATION OF SHORT-TAILED SHEARWATERS

Myres, M. T., and J. Guzman, Department of Biology, University of Calgary, Calgary, AB, T2N 1N4, Canada

The presentation will include maps, tables, and text to explain the proposed model of broad-front migration of Short-tailed Shearwaters.

CRECHE-LIKE BEHAVIOR IN FLEDGING HEERMANN'S GULL CHICKS

Velarde, Enriqueta. Instituto de Biología, Departamento de Zoología, Apartado Postal 70-153, 04510 México, D.F.

Behavioral observations have been carried out on the Heermann's Gulls nesting in Isla Rasa, Baja California. It was observed that around the time of fledging, chicks, which up to that time had stayed in their own territories, start to aggregate in groups of different sizes. The frequency and size of the groups vary with time of the day, being highest in the early morning. Also, relatively high synchrony of activities is observed within groups. With the maturation and growth of the chicks there is a relaxation of the territorial behavior and nest attendance from the parents. This, in conjunction with adult aggression, seems to stimulate the aggregation of several to many chicks, the largest groups containing nearly 300 chicks. These aggregations may serve as an anti-predator device, and they also seem to provide an adequate socialization environment for the chicks.

WINTER FEEDING ECOLOGY OF TRUMPETER SWANS ON VANCOUVER ISLAND

McKelvey, Richard W. Canadian Wildlife Service, Box 340, Delta, BC V4K 3Y3, Canada

The winter feeding ecology of Trumpeter Swans (Cygnus cygnus buccinator) was studied between 1977 and 1980 at the Somass River estuary, Port Alberni, and Comox Harbour, British Columbia. In general, estuarine foods were low in protein and high in fiber. The predominant food items were rhizomes of Scirpus americanus at Comox Harbour and Carex sp. rhizomes at Port Alberni. Microscopic analysis of scats at Comox revealed fronds of Zostera marina to be the most important food item. Feeding was the dominant activity in daylight periods (37.7% of the time), while sleeping predominated during the night (41.5%) and over the total 24 h period (36.0%). All types of behavior were found to be reducible to two basic types: feeding and resting. On average, 57.6% of a given daylight period and 47.2% of a night period was spent feeding on the estuary. Feeding on the estuary was regulated by tidal conditions which in turn caused both diurnal and nocturnal feeding. Approximately 10% of the available standing stock of emergent vegetation was removed annually from Comox Harbour. Based on estimates of regeneration time of emergent vegetation on the Fraser River estuary, the Comox Harbour habitat is thought to be capable of sustaining slightly higher levels of use.

FORMATION OF THE EGGS OF WHITE-FLIPPERED PENGUINS

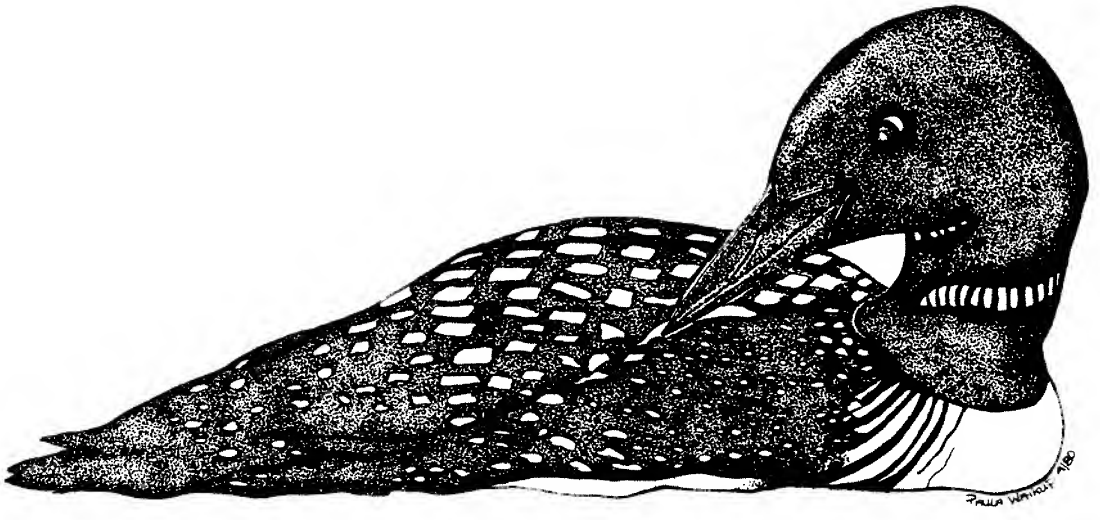
Grau, C. R. Department of Avian Sciences, University of California, Davis, CA 95616

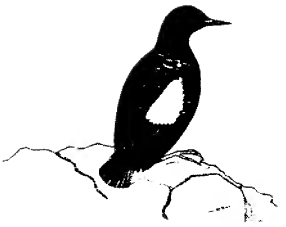
Female White-flippered Penguins (Eudyptula minor albosignata) breeding on Banks Peninsula, New Zealand, were fed capsules containing 75 mg Sudan black B dye and their eggs were collected 7-11 days later. After freezing the eggs, and fixing and staining the yolks, the day of yolk completion was determined from the position of the dye ring in relation to the daily deposition of yolk in rings. The total time of yolk formation was found to be 14 days (range 13-15), after which 4 days (range 3-5) elapsed before laying. Eggs (n = 10) weighed 60.5 g, contained 10.0% shell, 23.4% yolk, and 66.6% albumen. (The hospitality of the Department of Zoology, University of Canterbury, Christchurch, and the assistance of C. N. Challies and Lois S. Grau are gratefully acknowledged).

THE PHYLOGENETIC RELATIONSHIPS OF THE ALCIDAE

Strauch, Joseph G., Jr. University Museum (Zoology), Campus Box 218, University of Colorado, Boulder, CO 80309

The cladistic relationships of 20 living and 1 extinct taxa of alcids were examined by compatibility analyses of 28 mostly skeletal characters. A largest clique of 17 primary characters was found in the first analysis. Two subsequent analyses of monophyletic groups defined by the first analysis yielded four secondary characters. The puffins (Cerorhinca, Lunda, and Fratercula) were found to be a sister group to all other alcids. The relationships found generally agree with those previously suggested by Storer. An additional analysis using undirected character state trees examined the evolution of life history characteristics of the zoogeography of the family.





SCIENTIFIC TRANSLATIONS COMMITTEE

A 1981 update to the translation bibliography is being prepared and will appear in the Summer 1982 Bulletin.

Nine new translations of seabird research have been sent to the van Tyne Library. We have arranged with the JvT library for PSG members to receive copies of such translations for just the cost of copying and postage. This is infinitely cheaper than any of the other repositories. Full details will appear in the Bulletin.

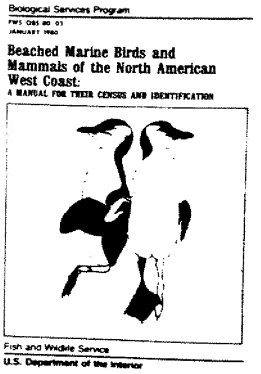
Negotiations with the international translating services still drag on. What we (the PSG, AOU, Wilson Society, and BOU) are most concerned with is the ownership of copyright. That is, if we send translations to the Crerar library for international distribution and access, can we still make copies for member use? Since this competes with their service, what started as a goodwill gesture has assumed the proportions of a legal debate with strong financial overtones.

A number of foreign monographs have been abstracted and sent to the AOU committee for consideration for translation (as in the case of Shuntov and Belopol'skii). Some notable examples are: Belopol'skii & Shuntov 1980, "Oceanic and sea birds," and Nechaev 1969, "Birds of the southern Urile Islands."

In collaboration with Prof. Il'yichev in Moscow, we are preparing a directory of seabird workers in the USSR. It may be done by summer.

I would very much like to be in contact with any PSG members who are attending the IOC meetings in Moscow next summer. We have some things that might work to our mutual advantage.

Douglas Siegel-Causey


Biological Services Program
Beached Marine Birds and Mammals of the North American West Coast:
A MANUAL FOR THEIR CENSUS AND IDENTIFICATION
Fish and Wildlife Service
U.S. Department of the Interior

LETTERS TO THE EDITOR

23 August 1981

Sir:

In response to your latest editorial in the PSG Bulletin I would like to make the following comments.

Annually PSG holds a gathering of seabird enthusiasts at which the level of energy and information exchange far exceeds that at other scientific meetings. This is largely due to PSG's structure, or more properly, non-structure. Missing from PSG meetings (but not missed) are the endless closed deliberations of elective members, fellows or council members, so characteristic of the meetings of other groups, which effectively remove an important segment of attendees from the intellectual part of the exercise. At PSG meetings everyone listens to papers, a great diversity of people give papers (instead of principally recent graduate students), and discussion is open, learned and nonstop. If PSG does nothing else but continue to bring us together in this way I rank it as a great success.

* * * * *

Your use of the words "fizzled out" in reference to PSG committees is not clear, especially when used to describe the committee on beached bird surveys. Please direct your attention to a publication, "Beached Marine Birds and Mammals of the North American West Coast" (FWS/OBS-80/03) which was described on p. 32 of Bulletin 7(1). This publication, as it states on p. 188, was the final report of that committee and since its appearance has been in great demand world wide. Would you kindly clarify your definition of "fizzled out."

Respectfully yours,

David G. Ainley
Pt. Reyes Bird Observatory

BOOK REVIEW

The Eastern Bering Sea Shelf: Oceanography and Resources, 1981. Edited by D. W. Hood and J. A. Calder. 2 Volumes. 1339 pp. Available from the University of Washington Press, Seattle, WA 98105. $65.00/volume.

Volume 1 contains chapters on Physical Oceanography, Ice Distribution and Dynamics, Geology and Geophysics, Chemical Oceanography, and Fisheries Oceanography. They provide an interesting and valuable introduction to the Bering Sea for the section on Marine Birds which opens Volume 2, which also contains chapters on Interaction of Ice and Biota, Mammals, Microbiology, Plankton Ecology, Fisheries Biology, Benthic Biology, Interaction of Sedimentary and Water-column Regimes, and Summary and Perspectives.

The following chapters concern birds:

Hunt, G. L., Jr., B. Burgeson, and G. A. Sanger. Feeding ecology of seabirds, pp. 629-647.

Hunt, G. L., Jr., Z. Eppley, and W. H. Drury. Breeding distribution and reproductive biology of marine birds, pp. 649-687.

Hunt, G. L., Jr., P. J. Gould, D. J. Forsell, and H. Peterson, Jr. Pelagic distribution of marine birds, pp. 689-718.

Gill, R. E., Jr., and C. M. Handel. Shorebirds, pp. 719-738.

King, J. G., and C. P. Dau. Waterfowl and their habitats, pp. 739-753.

Divoky, G. J. Birds and the ice-edge ecosystem, pp. 799-811.

The data combined in these papers make the eastern Bering Sea the best understood oceanographic system in the world; yet we really have just scratched the surface of comprehension. I had hoped for the "last word" on the Bering Sea from these volumes but the frequent reference to manuscripts in preparation and in press means we must await further attempts to summarize the avian data in relation to the total ecosystem.

It is obvious from these reports that the variability in biological systems makes their comprehension difficult. This may be due in part to the fact that a large number of people were collecting and trying to coordinate data over a relatively short period of time (3-5 years). Only considerable funds, such as were provided for these studies, but over a longer period of time will provide worthwhile, definitive data. I continue to be discouraged about studies that last a short time and cover small areas. Their relevance

to the real biological world and the validity of the data obtained remain questionable to me. If only these studies of the Bering Sea could continue...

The major conclusion I reach from these reports is that comparisons (between species, regions, islands, etc.) are going to provide the most useful and interesting data. I appreciate the authors' caution implicit in frequent use of such terms as "may have" and "probably," and wonder if the final synthesis, which I presume the authors are preparing, will provide more solid conclusions.

The three papers by George Hunt and co-authors on feeding ecology, breeding and reproduction, and pelagic distribution, are all clear expositions, based correctly on individual species, with concise summaries and discussion. The opportunistic nature of seabirds becomes obvious. The problems of monthly, yearly, and geographic variability are addressed and presented as major problems for further study. I am bothered by the lack of useful data on reproductive success (i.e., Table 39-1, and discussion). The difficulties of working on these cold, windy, inacessible islands, with many people collecting data, perhaps make the lack of refinement explainable. Certainly the locations of colonies are now well known, and at least a reasonable guess of population sizes is available. I continue to question the interpretation of "fatal sibling aggression" and active brood reduction as a means of maximizing productivity (p. 679). To me, the data clearly indicate a simple response to food availability, with the oldest young passively out-competing its smaller sibling for a limited resource. I still have not seen data to support "siblicide" as a strategy.

The huge volume of fish the seabirds consume clearly warrants further studies. I fear their diet will eventually cause the demise of the birds as commercial fishing by humans increases. As marine ornithologists, we must develop and encourage concern among the politicians for the stability of the marine system and interest in the welfare of animals with which we share the earth.

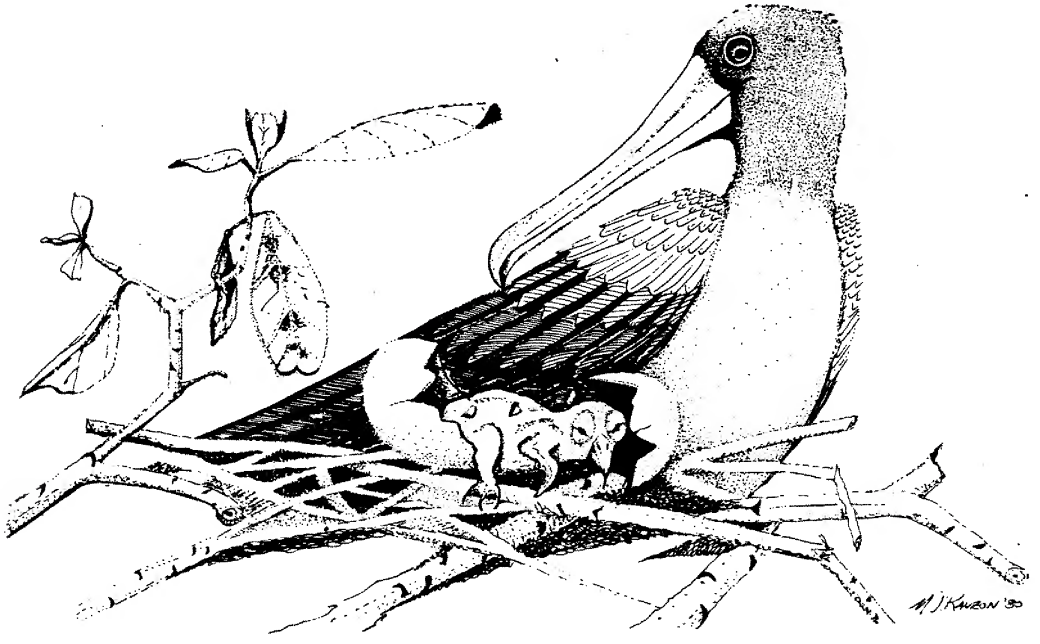
I look forward to the Hunt-Drury-Sanger-Gould summary of all the colony, feeding, and distribution data in one succinct review article.

The shorebird paper by Gill and Handel summarizes and updates the studies reported in the PSG publication edited by Frank Pitelka in Studies in Avian Biology. King and Dau ably summarize the waterfowl of the region and

emphasize what a negative impact "development" will have on those species. I found the short but concise discussion of the birds of the ice edge by George Divoky the most satisfying of these chapters as regards a habitat about which little is known.

This project was an enormous undertaking. We can only hope that the agencies involved will not drop the subject now that such a good start has been made. With continuing study we might reach a relatively complete understanding of this highly productive part of the world.

These volumes are well produced, the graphics excellent, and there are few typographical or other errors. They are expensive but are a must for anyone interested in marine ecosystems.--Ralph W. Schreiber.



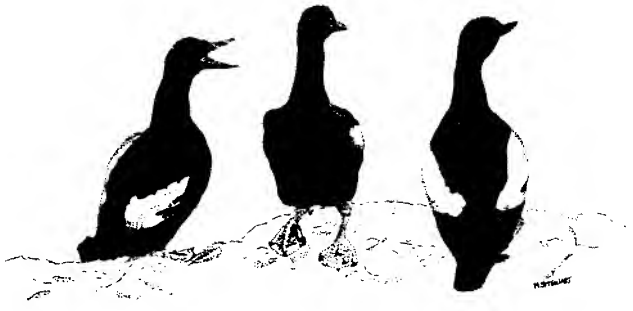
INTERNATIONAL FISHERY THREATENS SEABIRDS

[The following is reprinted from the July/August 1981 Environmental Defense Fund Letter.]

EDF's efforts to secure greater protection for Dall porpoise incidentally caught in the Japanese high seas salmon fishery off Alaska were reported in the May/June EDF Letter. Now a new EDF effort has begun, focused on the incidental loss of large numbers of seabirds caused by that same fishery.

Albatrosses, murres, auklets, shearwaters, puffins, and other seabirds become entangled in the nine-mile long nets deployed by the Japanese fishing vessels. Current rough estimates of seabird mortality in the nets run as high as three-fourths of a million birds annually. It is thought that this high mortality may be adversely affecting breeding populations in the western Aleutian Islands of Alaska.

EDF has persuaded the National Marine Fishery Service, which has placed several marine mammal observers aboard Japanese fishing vessels this summer, to collect data on seabird mortality. The Service has also agreed to develop a more comprehensive research program to determine the magnitude and significance of the seabird mortality caused by the fishery. EDF's efforts, led by Wildlife Program Chairman Michael J. Bean, should lead to better understanding of the magnitude of this problem and the means to ameliorate it.



ALDABRA APPEAL

The Appeal Committee of the Seychelles Islands Foundation reports in the second number of the Aldabra Appeal Newsletter that they have raised slightly over half their goal of $1 million for an endowment fund for the perpetual conservation of Aldabra. Additional income must be raised to assure the future of Aldabra beyond 1985. Donations may be sent to:

Aldabra Appeal
c/o The Royal Society
6 Carlton House Terrace
London SW1Y 5AG
England.

An international shallow marine program is planned for the Aldabra lagoon, beginning in 1983 and to extend for at least two years. Current research is focused on tortoises, turtles, vegetation, and coccids.

The Seychelles Island Foundation, to aid in its appeal for the conservation of Aldabra, has for sale T-shirts and beach hats with "I'm helping Aldabra" logo and postcards of Aldabra fauna and views. The T-shirts come in white, pastel blue, and navy, in sizes XS (child's), S (small), M (medium), and L (large). Prices are $10.00 for T-shirts, $5.00 for beach hats, and $1.50 for a set of six postcards--all prices plus postage and handling. If you are interested in purchasing any of these, please write to: Smithsonian Institution, Office of Biological Conservation, NHB W501 MRC166, Washington, D.C. 20560, for an order blank.

BULLETIN BOARD

Colonial Waterbird Annual Meeting

The Sixth Annual Meeting of the Colonial Waterbird Group will be held 4-7 November 1982 in Washington, D.C. A symposium on the feeding biology of waterbirds is planned. Papers given at the meeting are eligible, after refereeing, for publication in Colonial Waterbirds. Anyone wishing to contribute to either the symposium (deadline 1 Sept.) or general session (deadline 15 Sept.) should contact Dr. Michael Erwin, U.S. Fish and Wildlife Service, Patuxent Wildlife Research Center, Laurel, MD 20708. Information concerning registration can also be obtained from Dr. Erwin.

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Supermarket president
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Canada

Student
Studies: British Columbia seabird nesting records
Interests: Ecology and breeding strategies

Kenyon, Karl W. 11990 Lakeside Pl. N.E. Seattle, WA 98125	Wildlife biologist Studies: Seabirds and marine mammals Interests: Abundance and distribution
Lloyd, Denby S. Inst. Marine Science University of Alaska Fairbanks, AK 99701	Graduate student Studies: Relation of seabird population dynamics to oceanographic conditions Interests: Seabirds as indicators of oceanographic processes, population dynamics, and trophic relationships
Mahoney, Sheila A. Dept. Biological Science Florida Atlantic Univ. Boca Raton, FL 33431	Zoologist Studies: Frigatebirds, cormorants, anhingas, California Gulls Interests: Energetics, heat balance, salt and water balance
Maragos, James E. U.S. Army Corps of Engineers Pacific Ocean Div., Bldg. 230 Ft. Shafter, HI 96858	Environmental biologist Studies: Environmental studies, Pacific Islands Interests: Nesting of seabirds, seabird photography
McIntosh, Lorne D. 1879 Forrester St. Victoria, BC V8R 3G7 Canada	Graduate student Studies: Alcid distribution and oceanographic conditions Interests: Distributional patterns of alcids, effects of marine development and fishing on alcids
Mock, Patrick J. Dept. Biology Univ. California Los Angeles, CA 90024	Graduate student Studies: Breeding biology and energetics of Black and Least Storm-Petrels, Baja California

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DEDICATED TO THE STUDY AND CONSERVATION OF PACIFIC SEABIRDS AND THEIR ENVIRONMENT

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